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MEDICAL CAREERS IN PUBLIC HEALTH

CHAIRMAN'S ADDRESS

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MINNEAPOLIS

Physicians have always played leading roles in the initiation and development of public health work. Together with collaborating scientists they have contributed most of the scientific discoveries which have made the prevention of disease possible, and in cooperation with other public spirited citizens they have fostered movements to have these scientific developments incorporated into public practice. As a result, it has frequently been said that the medical profession, unlike any other professional group, has initiated and supported activities the object of which is to make its own services unnecessary.

By virtue of their training, physicians have occupied most of the positions of major responsibility in the field of public health work. Some of these have long been career positions on a full-time basis, but the majority of physicians engaged in public health work have been on a part-time basis and have had to depend primarily on the private practice of medicine for their livelihood.

In speaking primarily of physicians in organized public health work, I fully appreciate the fact that the individual physician engaged in the private practice of medicine is the one on whom most of the ultimate responsibility for carrying out the practices of preventive medicine and public health has always depended. As the diseases which can be controlled by administrative and sanitary measures are reduced and the so-called degenerative diseases, such as Bright's disease, cancer, mental illness and high blood pressure, which can be dealt with only on an individual basis, increase in relative importance, still more responsibility for prevention must be placed on the physician in private practice. Appropriate discussion of this role of the practicing physician in public health work will be presented by Dr. Grant Fleming in his paper on "Preventive Medicine in General Practice" later in this program.

Careers in public health have always attracted certain physicians who were interested in the prevention rather than the treatment of disease and who were challenged by the opportunities and the administrative problems involved in the control of disease among the population *en masse*. Opportunities for such careers, until relatively recently, however, have been limited in number and have been handicapped by political considerations, insecurity and inadequate compensation.

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Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-First Annual Session of the American Medical Association, New York, June 13, 1940.

Expansion in public health work has proceeded at a steady pace in this country for two or three decades, but new impetus has been given to this trend over the past five years by the provision of new and larger funds for health work as a part of the federal Social Security program. Public health programs supported by these funds must have the approval of the United States Public Health Service or the Children's Bureau, and to a high degree approval of a project is conditional on employment of personnel who meet the standards of training and experience recommended by the Conference of State and Provincial Health Authorities and approved by the Surgeon General of the United States Public Health Service. This has resulted in a great increase in the number of public health positions throughout the country and has limited these positions to qualified persons desirous of careers in this field, instead of permitting them to be prostituted for the payment of political debts or used to help build political machines.

QUALIFICATIONS AND TRAINING

The first requisites for success in public health work, as in every other field, are superior ability, industry, sound judgment and vision. Ability includes, first, intelligence and, second, aptitude for the particular field of public health in which one wishes to specialize. For example, for administrative positions in the general field of public health one needs so-called administrative ability in order that his department will function smoothly and efficiently, but he also needs what is commonly called political ability in order to get support for and public cooperation with his program. In technical positions, scientific ability is of first importance.

Industry and earnestness of purpose are essential for success, but these may miss the mark if they are not tempered by sound judgment, or they may accomplish nothing more than a routine, treadmill sort of job unless they are inspired by visions of greater accomplishments and new horizons.

Most of the leading figures in public health work up to the present time received their education in the "school of experience." There were no other schools available to them. These public health pioneers with superior ability and singleness of purpose learned and learned well by doing. In the last analysis, education is something which the individual must acquire for himself. There will never be any substitute for experience in either medical or public health training.

Yet the individual starting his career in public health today has the decided advantage of being able to learn in advance certain technics, which will be "the tools of his trade," to analyze and learn from the accumulated experiences of others, and to study the methods and procedures which have proved effective and those which have been found wanting in public health work. All this should enable him to start with a better under-

standing of his job and to develop it more rapidly than would otherwise have been possible.

Public health training may be obtained in any one of several schools or university graduate departments of public health. The separate schools of public health usually have the more highly specialized educational and research programs; but they may lack the valuable contacts with other graduate fields of medicine and with other related divisions of the university, such as public health nursing, sanitary engineering, political science, sociology, journalism and public speaking, which are available in the training programs of the university graduate departments of public health.

Fellowships or so-called training stipends to enable qualified physicians to obtain public health training are available from Social Security funds through state departments of health.

Supplementary to the year in public health at the university, the prospective health officer needs a period of practical experience in health work under supervision. This is analogous to the internship, which has long been recognized as necessary for the completion of a sound medical training.

Advanced training in public health covering one or more additional years is available to those who have demonstrated special aptitude in the work and wish further training in order to specialize in some field of public health. Fellowships for such advanced public health training may be provided either by the Rockefeller Foundation or by the United States Public Health Service through state health departments, utilizing Social Security funds.

TYPES OF OPPORTUNITIES

Administrative Positions.—The major positions in practically all public health organizations are administrative in character, yet the duties and responsibilities are such as to make medical training as well as public health training and experience essential as basic qualifications. The Committee on Professional Education of the American Public Health Association recommends that the educational qualification of health officers include the completion of a course leading to the degree of doctor of medicine in a recognized medical school, at least one year's internship in an approved hospital including a service in communicable diseases, a preliminary period of supervised field experience in a well organized department of health, and at least one full academic year devoted to the study of public health in a suitable university.

Health officers assume responsibility not only for environmental sanitation, laboratory work, vital statistics and general administrative problems but also for the control of communicable diseases, including tuberculosis and venereal infections, in which treatment is frequently involved, and for the reduction of morbidity and mortality among mothers and infants, involving not only antepartum and postpartum advice but also in some programs actual delivery service for certain groups of the population. The health officer is responsible also for the development of health programs in special fields such as cancer control, mental illnesses, industrial hygiene, and the identification and treatment of crippled children. In certain localities the expanding programs for the provision of medical care for indigent and near indigent groups of the population are under the direction of personnel especially trained in public health and employed either by welfare or by public health agencies. Much of the professional service involved in these various activities will always be provided by practicing physicians, but in addition a medical training is considered by health authorities to be not only desirable but essential as a background for the planning and execution of a modern public health program.

Most of the administrative positions in public health are with state, city, county or other governmental health agencies, although there are also a number of exceedingly important administrative posts in the United States Public Health Service as well as in various voluntary health agencies. Administrative positions may be in the general field of public health or in such special fields as maternal and child hygiene, communicable diseases, hospital or institutional administration, and mental hygiene.

Scientific Positions.—Various functions in the field of public health are technical in nature and require for their efficient discharge special scientific training and ability in a limited field. The more common of these fields are as follows:

Epidemiology: The study of the origin, the method of spread, and the control of disease constitutes the science of epidemiology. Success in epidemiology depends on skill in clinical diagnosis, keen observation and "common sense," as well as on the utilization of laboratory procedures, a knowledge of the epidemiologic characteristics of the disease concerned, and the statistical analysis of epidemiologic data. Every major health department has a staff of epidemiologists serving in this manner. Epidemiology is one of the major subjects included in the public health training course.

Laboratory Work: Public health departments have long been making laboratory diagnostic aids available to practicing physicians as well as to health officials for the control of such communicable diseases as diphtheria, tuberculosis, typhoid, meningitis, gonorrhea and syphilis. In recent years the typing of pneumococci has been added to this laboratory service, and recently several virus laboratories for the study of influenza have been established by the Rockefeller Foundation in connection with state departments of health. A few health department laboratories manufacture vaccines and serums for free distribution for the prevention and treatment of disease. It is being suggested also that health departments aid in the program for the control of cancer by providing pathologic examination of tissues submitted by practicing physicians. At least one state laboratory is now providing such service.

Vital Statistics: The collection and tabulation of birth and death records is a function of the health department. It is on the analysis of such data that the relative importance of public health problems can be judged and the effectiveness of control measures evaluated. Of especial significance are the various studies of morbidity which are being made by certain statistical workers in public health. Such studies provide important information concerning the health problems of the community and may suggest certain approaches to their control.

Research: Most progressive workers in the field of public health are carrying on studies to evaluate their own practices and procedures and to extend the range of fundamental information necessary for disease control. Personnel in laboratory, statistical and epidemiologic positions have greater opportunities to conduct such studies than those who are in administrative positions. In the National Institute of Health of the United States Public Health Service, large groups of scientists are devoting themselves exclusively to research studies

in the field of public health. All together such positions offer enviable opportunities to those who have the interest and ability for scientific investigation.

Clinical Positions: There is no sharp line of demarcation between what is ordinarily considered the province of public health work and that of clinical medical practice. In fact there are various fields of accepted public health responsibility in which the professional service is primarily, if not exclusively, clinical medicine. Most of these positions are in hospitals, such as the Marine Hospitals of the United States Public Health Service, or in tuberculosis or mental hospitals which are affiliated with state or local health departments. Most colleges and universities now have student health services which provide not only health instruction but also more or less complete medical service for their student populations. A few public health positions in this country, as in Canada, include responsibility for the medical care of the populace or at least the indigent portion of the citizens in the community. Certain health agencies also are providing consultants to cooperate with private physicians in the diagnosis and treatment of tuberculosis, cancer and obstetric and orthopedic conditions. Increasing services in the "twilight zone" between public health and clinical medicine are constantly placing greater clinical responsibilities on health officials.

PUBLIC HEALTH TEACHING

Teaching opportunities in schools of public health and in public health departments of medical schools are increasing rapidly. Most of these positions carry reasonably satisfactory salaries and permanent tenure and offer attractive opportunities for teaching and research. The qualifications for such positions include a good medical education, sound graduate training in public health and adequate and broad public health experience. In addition, one must possess ability as a teacher and have demonstrated scientific interest and achievement which will command the respect of his colleagues on the faculty. He should also have research interests which will contribute to his personal scientific development and will add to the store of scientific knowledge in his field.

Teaching positions are available also in many liberal arts colleges and teachers' colleges. Most of these are combined with responsibilities for the student health service.

HEALTH WORK IN INDUSTRY

The professional opportunities in the important and rapidly expanding field of health work in industry will be discussed in a special paper on this program entitled "Opportunities for Physicians in Industry," by Dr. Thomas L. Shipman.

COMPENSATION AND TENURE

Salaries for most administrative positions in public health range from about $3,000 to $6,000 a year. A few, on a full-time basis, fall below $3,000, a moderate number range from $6,000 to $10,000, and a very few are in excess of $10,000 a year. Scientific positions in public health work usually carry somewhat lower salaries than administrative positions, but they tend to be more secure from political interference. Clinical and teaching positions carry salaries similar to those of scientific positions. Positions in industrial medicine usually are on a somewhat higher salary scale than positions in official public health agencies.

Certain positions in public health, such as those in the United States Public Health Service, have always carried permanent tenure provided the individual's professional work continues to be satisfactory; but all too many other positions, unfortunately, have been at the mercy of the political party in power. Gradually, however, through the efforts of both governmental groups and civic organizations, public health is being taken out of the field of politics until today relatively fewer positions in public health are insecure because of political influence. Some of the major positions in state and city health departments are still considered as political barter, but rarely are the staff positions in these same departments disturbed even when there is a change in the departmental chief.

SUMMARY

The recent and future expansion of public health work demands more urgently than ever before competent and well trained leadership from the medical profession.

This expansion likewise is providing increasingly attractive opportunities to physicians for careers in the public health field.

Graduate training in public health is available in several schools and university departments of public health.

A certain number of fellowships for public health training are provided by state health departments from Social Security funds and in special cases by the International Health Division of the Rockefeller Foundation.

RHEUMATIC PERICARDITIS WITH EFFUSION TREATED WITH SALICYLATES

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Salicylates have been used in the treatment of acute articular rheumatism for some sixty years, but there remain wide differences of opinion with regard to their usefulness and mode of action. Yet the use of the drug persists, and studies of its clinical applications are still being published. In the United States, clinical practice largely restricts the use of salicylates to the relief of acute rheumatic arthritis. In Europe, particularly in France, the salicylates are regarded as valuable measures in the treatment of the cardiac manifestations of rheumatic fever.

A number of careful studies made in this country beginning with one by Miller [1] in 1914 and continuing to that of Master and Romanoff [2] in 1932 show that the administration of salicylates does not reduce the frequency of cardiac complications of patients with rheumatic fever. Wyckoff, DeGraff and Parent [3] demonstrated by electrocardiographic studies that the conduction disturbances which are evidences of rheumatic myocarditis are uninfluenced by salicylate therapy, although the drug may reduce the temperature to normal levels and maintain it there. Hanzlik,[4] in an exhaustive review of the action and uses of salicylates, states that salicylate therapy has no effect on heart failure in rheumatic fever and that salicylates neither prevent nor cure cardiac complications. Their effect is nonspecific; the action is antipyretic and analgesic and can be achieved equally with aminopyrine and cinchophen. More

From the Medical Service (Dr. George Baehr), Mount Sinai Hospital.

1. Miller, J. L.: The Specific Action of Salicylates in Acute Articular Rheumatism, J. A. M. A. **63**: 1107 (Sept. 26) 1914.
2. Master, A. M., and Romanoff, Alfred: Treatment of Rheumatic Fever Patients With and Without Salicylates, J. A. M. A. **98**: 1978 (June 4) 1932.
3. Wyckoff, John; DeGraff, A. C., and Parent, Solomon: The Relationship of Auriculoventricular Conduction Time in Rheumatic Fever to Salicylate Therapy, Am. Heart J. **5**: 568 (June) 1930.
4. Hanzlik, P. J.: Actions and Uses of the Salicylates and Cinchophen in Medicine, Medicine **5**: 197 (Aug.) 1926.

recently Lian and Facquet [5] concede that the therapeutic influence of sodium salicylate on the cardiac complications of rheumatic fever is slight.

Advocates of the specific action of the salicylates are represented by Danielopolu,[6] who administers from 15

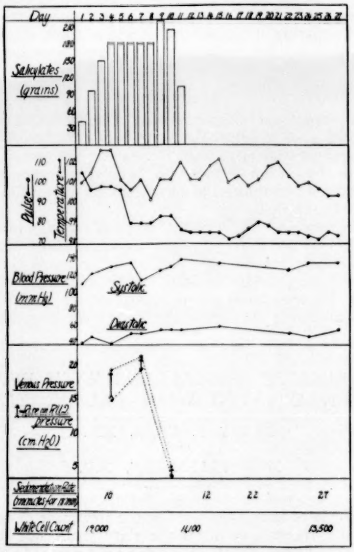

Fig. 1 (case 1).—Course of illness.

to 30 Gm. of sodium salicylate daily and who asserts that when the drug is given in adequate dosage within the first few days of the disease the heart may be spared. Most recently Bullrich and Sneider [7] report the successful treatment of cardiac infection in rheumatic fever with from 16 to 23 Gm. of sodium salicylate daily given by rectum by the drip method. Their case reports do not give convincing evidence of beneficial action of salicylates on the cardiac lesion.

In spite of the controversy which now has extended over two generations, many competent clinicians still believe that the drug exerts a favorable action on the course of rheumatic fever. Coombs [8] writes that "the administration of salicylate does limit the extent of the cardiac lesions"; Findlay [9] states that he has no doubt that salicylates given in sufficient amount are veritable specifics against rheumatic arthritis, and White [10] says that the drug "has a certain specific control of the rheumatic infection."

Our experience with salicylates in rheumatic carditis associated with pericardial effusion dates back some two years. At that time one of us had under his care at the Mount Sinai Hospital a young boy gravely ill with rheumatic fever and pericarditis with effusion. He was orthopneic and cyanotic, his pulse rate was 132, and there was gallop rhythm. With the idea of reducing the fever and thus reducing that part of the cardiac acceleration caused by the fever, he was given large doses of salicylates. Within twenty-four hours not only had the temperature dropped to normal but the whole clinical picture had changed. The boy was comfortable, the dyspnea and cyanosis had largely subsided, and the pulse rate had dropped to 90. Uninterrupted improvement continued.

The response was so dramatic and encouraging that similar therapy has since been used in a dozen cases. In several cases in which cardiac tamponade was so severe that pericardial paracentesis seemed urgently indicated, salicylates were administered and the symptoms were promptly alleviated. Since employing this medication we have had no occasion to aspirate the pericardium of any patient with rheumatic pericarditis. The results have all been satisfactory. There has been rapid alleviation of a sense of oppression and anxiety and a return to a state of comparative well-being. Two of these cases are here briefly summarized, and their course and features illustrated graphically:

REPORT OF CASES

CASE 1.—J. P., a boy aged 13 years, with two known previous attacks of rheumatic carditis, for the two weeks preceding admission to the Mount Sinai Hospital had malaise, pain

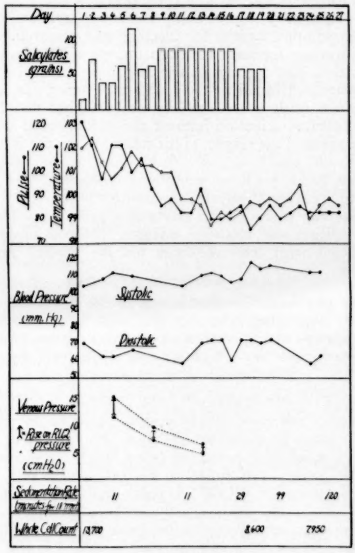

Fig. 2 (case 2).—Course of illness.

in the shoulders and chest, rise in temperature to 104 F. and profuse diaphoresis. Progressive dyspnea, orthopnea and cough developed. One day before admission he complained of precordial pain.

The boy was pallid and dyspneic with flaring alae nasi. Vessel pulsations were visible in the neck. Over the left lower posterior part of the chest there were dulness and bronchial

5. Lian, C., and Facquet, J.: Remarques cliniques et thérapeutiques sur le rhumatisme articulaire aigu, Bull. et mém. Soc. méd. d. hôp. de Paris **53**: 1564 (Dec. 20) 1937.

6. Danielopolu, D.: Traitement du rhumatisme polyarticulaire aigu par les doses massives de salicylate, Presse méd. **31**: 1045 (Dec. 15) 1923.

7. Bullrich, R. A., and Sneider, David: Reumatismo cardiaco primitivo, monosintomático, Bol. Acad. nac. de med. de Buenos Aires, August 1938, p. 285.

8. Coombs, C. F.: Rheumatic Heart Disease, New York, William Wood & Co., 1924, p. 323.

9. Findlay, Leonard: The Rheumatic Infection in Childhood, Baltimore, William Wood & Co., 1932, p. 162.

10. White, P. D.: Heart Disease, New York, Macmillan Company, 1931, p. 338.

breath sounds with bronchophony. The heart was markedly enlarged, in globular fashion. There was a systolic thrill at the base. Systolic and diastolic murmurs were audible at the apex, and a diastolic murmur was heard at the base. The heart sounds were distant. On percussion, hepatic dulness extended into the epigastrium.

The course and laboratory data are depicted in figure 1. He received large doses of salicylates, averaging from 150 to 200 grains (10 to 13 Gm.) a day, for eleven days. Objectively there was a sharp drop in the venous pressure, which is a direct reflection of the relief of the cardiac tamponade. Serial x-ray studies of the chest showed progressive diminution in the size of the cardiac shadow and resorption of the pericardial exudate. There was a sharp drop in the temperature curve. It is interesting that there was no demonstrable effect on the rheumatic activity per se as judged by the persistence of tachycardia, rapid sedimentation time of the red blood cells and leukocytosis. Subjectively the patient soon markedly improved, and on the fourth day he stated that he "felt better than ever before." On the tenth day, Kussmaul breathing developed and a blood carbon dioxide determination revealed that acidosis had developed. The drug was then stopped and these symptoms disappeared. The course of the disease after this followed the usual pattern of subacute rheumatic activity for weeks.

CASE 2.—B. C., a boy aged 14 years, had a noncontributory past history except for a tonsillectomy at the age of 8. The present admission to the Mount Sinai Hospital, his first entry, resulted from a train of symptoms dating back some four months. At that time he complained of unusual fatigue and dyspnea, followed by orthopnea and migratory polyarthralgias accompanied by a temperature of 100 or 101 F. Four days before admission there was a marked increase in chest and shoulder pain and the temperature rose to 102. This was attended by marked weakness and exhaustion.

The boy was tall, pallid, febrile and dyspneic. He complained of chest pain. The lungs were clear. On percussion the heart was markedly enlarged, being percussible 14 cm. from the sternum in the fifth intercostal space. The heart sounds were distant and of poor quality. A protodiastolic gallop rhythm was present. Apical systolic and diastolic murmurs were heard. The blood pressure was 104 systolic, 70 diastolic. The liver was palpable and tender.

The course and laboratory data are depicted in figure 2 and in the reproductions of roentgenograms. The progressive drop in temperature and venous pressure attendant on the administration of salicylates is evident. Objectively the changes in physical signs, corroborated by x-ray examination, were much more prominent. Four days after admission there was considerable diminution in cardiac dulness, so that whereas the heart had been percussible more than 2 fingerbreadths to the right of the sternum, it was now at the sternal margin. Figure 3 shows the x-ray appearance of the chest the morning following admission with the typical appearance of a pericardial effusion. Figure 4, taken five days later, shows marked decrease in the size of the cardiac shadow. Figure 5, taken one week later, shows even further diminution of the cardiac shadow, resorption of the effusion, and a heart only slightly enlarged. Subjective improvement was even more striking. Within a few days he became very comfortable and much more alert. During the course of administration of the drug, evidence of salicylism in the form of ringing in the ears developed at one time, but this soon disappeared.

Ten other patients similarly treated all displayed a similar beneficial response to massive salicylate therapy.

Fig. 3 (case 2).—Appearance on the morning after admission.

Fig. 4 (case 2).—Five days after admission.

Fig. 5 (case 2).—Twelve days after admission.

COMMENT

Reports of the successful salicylate treatment of rheumatic pericarditis with effusion have appeared, chiefly in the French literature.[11] Paliard and Badenand [12] go so far as to state that in rheumatic fever unaccompanied by arthritic manifestations, but attended by pericardial involvement, the diagnosis rests on the rapid amelioration of the symptoms with salicylate therapy. Schultz [13] found that occasionally the resorption of serous pericarditis and pleurisy was apparently hastened through the antiexudative action of aminopyrine. Here again the activity of the underlying carditis was not allayed. Cassoute and his co-workers [14] report rapid improvement and resorption of fluid in rheumatic pericarditis with effusion following the exhibition of the salicylates. Murray-Lyon,[15] on the other hand, found no beneficial effects of the drug in either the treatment or the prevention of rheumatic pericarditis.

The beneficial effects of salicylates on certain manifestations of rheumatic fever such as arthritis and pericardial effusion, and their apparent failure to stem the progress of other lesions such as endocarditis and myocarditis, may be related to the fact that arthritis and pericarditis represent exudative and the other lesions proliferative reactions to the rheumatic infection. Swift,[16] after studying excised joint tissue in rheumatic fever before and after the administration of salicylates, concluded that "probably the most characteristic feature of this disease is the disappearance of exudation and the symptoms dependent upon it following the exhibition of sufficient doses of certain drugs" (i. e. the

11. Herman, P.: Contribution à l'étude des formes extra-articulaires de la maladie de Bouillaud, Thesis, Paris, 1929. Brodin, P., and Guyot, G.: Un cas de péricardite aiguë, primitive à gros épanchement vraisemblablement d'origine rhumatismale, Bull. et mém. Soc. méd. d. hôp. de Paris **47**: 299 (March 2) 1931. Dimitracoff, C.: Péricardite exsudative et myocardite rhumatismale d'origine primitive, Arch. d. mal du coeur **27**: 337 (June) 1934. Paliard and Badenand.[12]

12. Paliard, F., and Badenand, L.: La forme médiastino-pleurale de la maladie de Bouillaud, J. de méd. de Lyon **18**: 205 (April 5) 1937.

13. Schultz, M. P.: The Use of Amidopyrine in Rheumatic Fever, Arch. Int. Med. **48**: 1138 (Dec.) 1931.

14. Cassoute, E.; Giraud, Paul, Montus and Tissot: Péricardite primitive avec épanchement sans endocardite ni manifestations articulaires. Guérison par le traitement salicylé, Bull. Soc. de pédiat. de Paris **32**: 425 (July) 1934.

15. Murray-Lyon, R. M.: Salicylates in Rheumatic Fever, Edinburgh M. J. **43**: 84 (Feb.) 1936.

16. Swift, H. F.: Rheumatic Fever, Am. J. M. Sc. **170**: 631 (Nov.) 1925.

salicylates). On the other hand, the proliferative response remains unaffected.

The relief of the cardiac tamponade following resorption of the pericardial effusion readily accounts for the prompt subjective and objective alleviation of the symptoms. The other cardiac lesions are a result of a proliferative process and consequently unresponsive to and unaffected by the drug.

SUMMARY

Salicylates given in large doses bring about prompt relief in acute rheumatic pericarditis with effusion. There result a rapid reduction in the pulse rate and a resorption of the pericardial exudate with quick relief of dyspnea and toxemia.

The salicylate action of pericarditis with effusion seems to be analogous to its action in arthritis with effusion. There are a rapid absorption of exudate and diminution in fever.

Salicylates exert no effect on the course of rheumatic infection or on the course of rheumatic endocarditis and myocarditis.

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SURGICAL TREATMENT OF HEMIATROPHY OF THE FACE

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Progressive facial hemiatrophy is a self-limited condition that always leaves in its wake a grossly apparent facial deformity. It is not a rare syndrome, and a bibliography of more than 400 articles reporting, often in detail, over 450 cases [1] shows that it has not been neglected by the medical profession. No specific treatment is known that will always stop the progress of the disease. It is remarkable, then, that few observations are available in the literature on the surgical repair of the inevitable disfigurement that results. It is our purpose in this paper to summarize the present knowledge of this condition and record our experience gained in six cases from surgical reconstruction with fat, fascia and dermal grafts.

DESCRIPTION

Hemiatrophy of the face may involve any or all of the superficial tissues, affecting skin, subcutaneous fat and muscles and at times bone and cartilage as well. The disease process starts in one or more focal points on the head and within a period of a few months to a few years may spread to involve the whole side of the face and scalp. Cases are reported in which the atrophy not only crossed over to the other side of the head but spread to the torso and limbs also. Characteristically, however, the disease is delimited to an area often suggestive of the distribution of branches of the trigeminal nerve. Involved skin frequently shows a brownish yellow pigmentation; owing to loss of subcutaneous fat and wasting of underlying muscles, the skin is depressed and sometimes adherent to the deep fascia. A sharp borderline often demarcates pathologic from normal tissue, an appearance at times so striking that it has given rise to the term "coup de sabre." Coincidentally with atrophy of skin and subcutaneous fat there are generally, but not consistently, an associated fibrosis of arterioles and capillaries and a disintegration of sweat glands and atrophy of hair follicles, giving rise to patches of scleroderma and alopecia. The motor nerves are not affected. The cosmetic result of this condition, therefore, is that of a unilateral wasting away of a part or the whole of one side of the face, with some areas of the skin showing an unsightly brownish pigmentation and others a whitish sclerodermic atrophy. Patches of alopecia on the scalp and lack of development of nasal and aural cartilage or of the bony framework accentuate the disfigurement.

ETIOLOGY AND PATHOGENESIS

No one etiologic factor can be consistently demonstrated in all cases. In their monograph on facial hemiatrophy, Archambault and Fromm [1] report an incidence of antecedent injury in from 24 to 34 per cent of cases. Many times such injury, however, may have occurred years before the lesion was first noted. Since the disease most commonly starts in the first fifteen years of life a history of previous infection such as diphtheria, mastoiditis, local abscess or tuberculous cervical adenitis is frequently brought forth as the primary cause of the hemiatrophy. However, the high incidence of such infectious conditions in childhood makes it difficult properly to evaluate the etiologic role of such factors.

Cassirer [2] believed the pathogenesis of scleroderma and of facial hemiatrophy to be the same—a vasospasm of the sympathetic system. Archambault and Fromm, reviewing the more probable theories of pathogenesis, conclude "beyond a doubt" that involvement of the cervical sympathetic system alone frequently results in hemiatrophy of the face. They cite a series of ten cases in which hemiatrophy directly followed compression or injury of the cervical sympathetic system from such diverse causes as thyroid enlargement, cervical rib, tuberculous adenitis, cicatrix of the neck following burns, sarcoma of a cervical vertebra and trauma during a mastoid operation. They point out that the wide variation in the clinical syndrome can perhaps be explained on the assumption that separate trophic fibers run in the sympathetic trunks to the vasomotor and pilomotor systems and the organs of lacrimation and perspiration. The exciting pathologic state can be either irritating or paralyzing, and the result, therefore, is widely different in individual cases.

Cases of hemiatrophy are reported frequently as delimited by the sensory distribution of branches of the trigeminal nerve. It seems possible that such a distribution might be explained on a vascular basis, relating to areas affected by discrete vasospasm, since pain, paresthesia and anesthesia are relatively uncommon. Moreover, the removal of the semilunar ganglion does not produce the characteristic atrophic lesions.

It seems reasonable to conclude that hemiatrophy of the face most frequently results from infection or trauma causing injury to "some point, peripheral or central, of the sympathetic division of the 'vegetative' nervous system." [1]

TREATMENT

The scarcity of observations on the treatment of hemiatrophy attests the present ignorance of the primary pathologic condition and the inadequacy of any present therapy. Treatment might properly be divided into three phases: (1) investigation of the underlying

From the Plastic Clinic of the Massachusetts General Hospital.

1. Archambault, La Salle, and Fromm, N. K.: Progressive Facial Hemiatrophy, Arch. Neurol & Psychiat. **27**: 529-584 (March) 1932. Merritt, Katherine K.; Faber, H. K., and Bruch, Hilde: Progressive Hemiatrophy of the Face: Report of Two Cases with Cerebral Calcification, J. Pediat. **10**: 374-395 (March) 1937.

2. Cassirer, Richard: Die Vasomotorisch-trophischen Neurosen, Berlin, S. Karger, 1912.

condition, (2) treatment of the local manifestations while the disease is in progress and (3) treatment of the final deformity resulting from this condition.

1. *Investigation of the Primary Pathologic Condition.*—Pathologic change of the cervical sympathetic system should be suspected in every new case, and conditions that can be eliminated surgically must first be ruled out. Careful examinations must therefore be made for infections, tumors, congenital cysts of the neck and bony anomalies of the spinal vertebrae and face. When such factors cannot be discovered, an evaluation of the vasospastic component of the condition is indicated. Sometimes the cold and clammy appearance of the cutaneous area involved suggests the role of vascular spasm. A biopsy of affected skin may show a relative endarteritis similar to that seen in Raynaud's disease. Cutaneous temperature recordings may show a definite and satisfactory increase after foreign protein shock or procaine hydrochloride block. Such observations suggest that cervical sympathectomy may check the course of the disease. It has been pointed out,[3] however, that if the condition has already progressed to the stage of fibrosis,

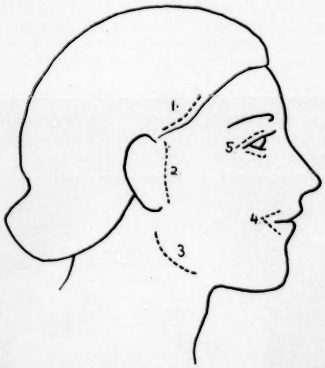

Fig. 1.—Incisions used for introduction of dermal grafts.

strangulation and destruction of capillaries and arterioles there will be no value in any such vasodilating procedure.

2. *Treatment of Local Manifestations.*—Localized patches of scleroderma are frequently but not consistently present as a component of the syndrome of hemiatrophy of the face. The literature is replete with a variety of treatments suggested for this condition. Perhaps the most logical approach is, again, that of sympathectomy in cases that exhibit features of vasospasm.[4] Oliver and Lerman[5] used injections of solution of posterior pituitary with benefit in some cases, believing that this effect resulted from active exercise of the peripheral vascular system through sympathetic stimulation. Reports of hypercalcemia associated with scleroderma have led some observers to advocate parathyroidectomy[6] or ketogenic diets.[7] Little attention, however, is now paid to the latter procedures.

3. *Treatment of the Final Deformity.*—Inorganic materials such as paraffin or white petrolatum in oil at one time were injected subcutaneously to fill in the defects. These materials not only cause permanent disfigurement but also set up inflammatory changes in the tissues and have been wholly discarded.

Autogenous transplants of bone, fat, fascia and skin are available for this purpose. Underlying maldevelopment or atrophy of the bony framework may make transplantation of bone a necessary step. As a rule, however, the major defect is the loss of subcutaneous fat.

Moszkowicz[8] took long strips of fascia lata with the overlying fat attached in a case of hemiatrophy. With a large trocar, tunnels were made under the skin of the cheek through a small incision in front of the tragus and the fascial strips were then threaded into the tunnels through the trocar. By this method the thin transplant strips were prevented from sagging into a lump as they were each deposited into individual grooves made by the trocar, with septums of tissue intervening. He stressed the importance of overcorrection of the deformity to take into account the later resorption of the fat.

Eitner[9] overcame the resorption that results from free transplantation of fat by developing from the temporal region an "island" flap of skin and fat. An isolated island of skin of full thickness, attached only to its pedicle of fat, was brought down from the forehead and introduced beneath the depressed skin of the cheek. The broad base of the pedicle insured a good blood supply, and the result was said to be excellent after three months. This ingenious procedure, however, is obviously limited to cases in which hemiatrophy is sufficiently localized so that normal skin and fat are available in an adjacent region.

Cotton[10] reported one case of hemiatrophy in which finely cut gluteal fat in large quantity was found satisfactory. Such finely subdivided fat grafts made it possible to model smoothly the edges of the transplanted tissue in the area of the defect where the skin was undermined. In this case, surprisingly enough, there resulted no marked resorption or atrophy of this tissue during the four years the patient was followed.

An experimental study on animals of the behavior of free fat transplants (Gurney[11]), however, leads to conclusions that do not corroborate Cotton's experience. In this work Gurney concluded that (1) multiple pieces of fat do not survive as well as one large one; (2) trauma to the graft definitely lessens its ability to survive; (3) a slight amount of oozing in the recipient area definitely lessens the viability of the graft; (4) fat is not replaced by scar tissue but the shrinkage is due to phagocytic action, and (5) only from one fourth to one half of the original fat transplant survives at the end of one year.

Free transplants of dermis and fat have been used in repairing small defects (Straatsma[12]). The possibility of the formation of small dermoid inclusion cysts

3. Mayo, W. J., and Adson, A. W.: Raynaud's Disease: Thrombo-Angiitis Obliterans and Scleroderma: Selection of Cases for and Results of Sympathetic Ganglionectomy and Trunk Resection, Ann. Surg. **96:** 771-783 (Oct.) 1932.

4. Brown, G. E.; Craig, W. M., and Adson, A. W.: Selection of Cases of Thrombo-Angiitis Obliterans and Other Circulatory Diseases of the Extremities, for Sympathetic Ganglionectomy, Am. Heart J. **10:** 143-155 (Dec.) 1934.

5. Oliver, E. L., and Lerman, Jacob: Scleroderma Treated with Injections of Posterior Pituitary Extract, Arch. Dermat. & Syph. **34:** 469-477 (Sept.) 1936.

6. Leriche, René; Jung, Adolphe, and De Bakey, Michael: Surgical Treatment of Scleroderma, Surgery **1:** 6-24 (Jan.) 1937.

7. Kennedy, R. L. J.: Calcinosis and Scleroderma: Treatment of Case by Use of Ketogenic Diet, J. Pediat. **1:** 667-673 (Dec.) 1932.

8. Moszkowicz, Ludwig: Treatment of Hemiatrophy by Means of Fat Transplants, Med. Klin. **26:** 1478 (Oct. 3) 1930.

9. Eitner, Ernst: Cosmetic Surgery in Hemiatrophy of the Face, Wien. med. Wchnschr. **87:** 362-363 (March 27) 1937.

10. Cotton, F. J.: Contribution to Technic of Fat Grafts, New England J. Med. **211:** 1051-1053 (Dec. 6) 1934.

11. Gurney, C. E.: Experimental Study of Behavior of Free Fat Transplants, Surgery **3:** 679-692 (May) 1938.

12. Straatsma, C. R.: Use of Dermal Graft in Repair of Small Saddle Defects of the Nose, Arch. Otolaryng. **16:** 506-509 (Oct.) 1932.

was investigated by Peer and Paddock.[13] These authors scraped the superficial epidermis with a razor, then excised small pieces with underlying fat and buried them subcutaneously. At intervals of one, two and three weeks and two, seven and twelve months biopsies were

Fig. 2 (case 1).—Preoperative appearance, showing right facial hemiatrophy, Oct. 18, 1923.

studied. This investigation showed that all hair follicles, sweat glands and sebaceous cysts degenerated and disappeared during the course of the experiment. In most sections, microscopic cysts lined with epithelium or encapsulated by nonepithelized granulating tissue were found. These tiny cysts were thought to result from incomplete removal of the epidermis and did not progress or enlarge during the course of a year.

OPERATIVE TECHNIC

On the basis of our experience with six cases of facial hemiatrophy, treated surgically for the correction of the deformity, the following points appear to be worth emphasizing:

1. *Selection of Recipient Area.*—A definite area is first decided on for reception of transplanted tissue. In our first case the temporal region alone was selected. In later cases increasingly larger areas were undermined, but care was taken to divide them into separate compartments so that if a complication developed about one graft the others would not necessarily be jeopardized.

2. *Incisions.*—The various incisions shown in figure 1 were chosen in order to give convenient access to the areas selected for grafting and to leave scars least likely to be conspicuous. We selected (1) for the temporal region, incision with the hairline; (2) for the cheek, a vertical incision in front of the tragus, close to the anterior margin of the ear; (3) for asymmetrical jawline and chin, a curved incision behind the angle of the mandible; (4) for the corner of the mouth and lips, incisions at the mucocutaneous margins of the lips, and (5) for the orbital region, horizontal incisions parallel to the lid margins.

The most unfavorable of these incisions was found to be the fourth. Owing to the proximity and mobility of the mouth, it is difficult to keep the incisions dry, and the chance of sepsis is increased. Moreover, although scars along the vermilion border are inconspicuous, yet slight contractures near the corner of the mouth may alter considerably the pull of the oral muscles. In one case, that of a professional singer, the tightness of small scars near the angle of the mouth caused considerable discomfort.

3. *Undermining of the Skin.*—The tunneling under the skin is done by blunt dissection with scissors, and an effort is always made to find and follow the superficial facial plane where less bleeding is encountered. As emphasized by Gurney,[11] hemostasis is extremely important to the survival of transplants and it is important to have all active bleeding under control before the graft is introduced. The cavity is therefore packed tightly either with salt solution sponges or, if the bleeding is brisk from deep within the undermined area,

Fig. 3 (case 1).—Appearance after the first three transplantations of fat and fascia, April 6, 1926.

with gauze saturated with 1:1,000 solution of epinephrine hydrochloride. External pressure is then applied by the assistant while the transplant is removed from the donor site.

4. *Removal of the Transplant.*—For the purposes of transplantation we have used (1) fat alone, (2)

13. Peer, L. A., and Paddock, Royce: Histologic Studies on Fate of Deeply Implanted Dermal Grafts, Arch. Surg. 34: 268-270 (Feb.) 1937.

fascia alone, (3) fat and fascia, (4) dermal graft and fat, and finally (5) dermal graft, fat and fascia in one block.

In our experience, transplantation of fat alone has been disappointing. The graft invariably diminishes

Fig. 4 (case 1).—Appearance after six operations to correct facial atrophy, Feb. 10, 1928.

greatly in bulk and appears to be replaced by fibrosis. Contrary to other reports, we have not seen transplanted fat alone survive as adipose tissue.

It has been asserted that if the underlying fascia is removed with the fat from the donor area there is a better prospect for the viability of the fat. While our experience shows more encouraging results with this procedure, we feel that perhaps the additional degree of success, as contrasted with the results of fat alone, was probably due to the additional presence of the fascia.

Fascia alone seems to survive with the least amount of absorption. Where only a slight addition to the contour is necessary, as in the temporal or frontal regions or within the orbit, it has proved very satisfactory. In other areas it is often not possible to secure adequate amounts of fascia alone.

For more than two years we have utilized dermal grafts including fat and sometimes fascia in a block with promising results. Either the thigh or an elliptic area of the abdominal wall curving over the iliac crest is selected as the donor area. In obese patients, in whom the fat layer between dermis and fascia is often thicker than necessary, the lower part of the thigh may be used. With a skin graft knife a thin layer of epidermis is split from the donor site. The desired amount of tissue containing dermis, fat and fascia is then excised in a block. The defect is generally closed by swinging a pedicled flap of skin and fat from an adjacent area. If only dermis and a part of the fat layer are removed, the thin skin graft may be sutured back into place to cover the raw surface.

5. *Deposition of the Transplant.*—The transplant is then deposited in the recipient area either after cutting it in small cubes about 2 cm. in dimension or in one large piece. The former allows utilization of small skin incisions, but a single large block can be spread more evenly and secured in position more readily by means of "in and out" mattress sutures. These sutures are applied as follows: Mattressed silk stitches with long straight needles threaded on both ends are placed at the corners of the dermal graft. The needles are brought up through the skin of the face, and the sutures are tied over gauze at the desired points. Thus, if the region of the cheek has been undermined four sutures are placed, one at the zygomatic region, one on the side of the nose near the orbital ridge and the other two

Fig. 5 (case 1).—Appearance Dec. 8, 1939, twelve years after the last operation.

toward the lower border of the mandible. A Killian nasal speculum makes an ideal instrument to hold apart the two surfaces of the tunneled area and allows the needles to pass through the skin at the right places. In all our operations the dermal side of the transplant has been applied next to the skin.

6. *Closure and Dressing.*—The skin incisions are closed without drainage. External pressure is applied evenly over the entire side of the face with an elastic bandage. The patient is put on a liquid diet and not allowed to masticate food for ten days.

Fig. 6 (case 2).—Preoperative appearance, showing right hemiatrophy of the face, April 15, 1937.

7. *General Considerations.*—It is perhaps unnecessary to emphasize that extreme gentleness should be used in handling and shaping the transplant. Uncalled for crushing or trauma to the graft results in slough and necrosis. The nose and mouth cavities should be completely isolated from the surgical field. In one case an accidental puncture through the buccal mucosa led to infection and loss of the transplant.

We found that all types of graft which include adipose tissue undergo considerable absorption, and therefore overcorrection of the depression with one half to two thirds more tissue than apparently necessary is indicated.

Repeated operations must usually be performed in these cases. Although perfect symmetry of the face cannot be obtained, a satisfying degree of improvement may be acquired.

It is probably not without significance to note the change in outlook and mental attitude that often keeps pace with the patient's realization that a concrete and visible effort is being made to repair the defect. The possible significance of this is that, as a corollary to dropping an inferior attitude in their relation to society, some of these patients begin to put on weight. The filling out of the face is not apparently limited to the normal side; gaining weight appears thus to have a salutory effect in maintaining the bulk of the transplant or checking its resorption.

This is well shown in both cases to be presented, the first and the last in the present series, summarized to bring out some of the points of treatment and operative technic previously discussed.

REPORT OF CASES

CASE 1.—E. M., a student nurse aged 26 years, was first seen in October 1923 with a complaint of right hemiatrophy of the face. No known etiologic factor is recorded in the history. Examination showed atrophy of the subcutaneous fat and muscles of the temporal region and cheek and over the mandible (fig. 2).

The first operation was performed Aug. 7, 1924. A transplant of fat only was removed from the anterior aspect of the right thigh and inserted beneath the skin of the right temporal region after this area was undermined through an incision at the hairline. Wounds healed cleanly and she was discharged nine days later.

At the second operation, July 6, 1925, a block including fascia as well as fat was removed from the left thigh and transplanted

Fig. 7 (case 2).—Appearance after the first transplantation, Feb. 21, 1938.

under the skin of the cheek through an incision in the right nasolabial fold. Sepsis developed in this transplant, necessitating drainage, and at discharge five weeks later the major part of the grafted tissue had been lost.

The third operation was performed six months later, Jan. 13, 1926. An incision was made at the angle of the right mandible

and after the adhesions resulting from previous sepsis in the cheek had been freed a block of fat and fascia from the right thigh was inserted under the skin. The patient was discharged three weeks later with the wounds well healed.

At the fourth admission the previous transplants showed little resorption (fig. 3). At operation April 6 the previous

Fig. 8 (case 2).—Appearance after the third operation, March 24, 1939. Note that the patient shows a gain in weight manifested by a rounding out of the unaffected side.

scar in the cheek fold near the corner of the mouth was reopened, and fat from the right thigh was implanted in the cheek.

On Jan. 26, 1927, the patient was readmitted for the fifth operation. The old scar near the corner of the mouth was incised and a piece of fat and fascia measuring 3 by 1½ inches from the right midthigh was introduced, after blunt dissection, into the cheek.

At the sixth and last operation, Aug. 2, 1927, small pieces of fat and fascia were applied at the inferior orbital ridge and to round out the contour of the cheek.

When seen Feb. 10, 1928, the appearance of the face showed considerable improvement (fig. 4). On examination May 17, 1929, almost five years after the first operation, it was noted that the fat transplants in the cheek and about the eyelids had absorbed somewhat, but the result was considered reasonably satisfactory.

The patient was then not seen for ten years. When we saw her on Dec. 8, 1939, fifteen years after the first operation, it was found that over this period a good deal of the fat and fascia transplant had resorbed (fig. 5). However, in comparison with her original pictures there was considerable improvement.

CASE 2.—*History.*—E. W., an intelligent girl of 14 years, was first admitted to the Massachusetts General Hospital July 1, 1934, with the complaint that the right side of her face had become progressively sunken through the last two years. When 6 years old, six years before the onset of any noticeable change, she struck her right forehead against an iron brace severely enough to lose consciousness. The past history included measles, chickenpox, whooping cough, scarlet fever and a tonsillectomy performed at 11 years. The family history was irrelevant. In December 1931, one week after recovering from bilateral pink eye, the patient first noted a white patch beneath the right eye. This patch became elevated like a callus, then peeled. Shortly after this a similar patch appeared on the right side of the forehead, and from then to the present there had been a gradual painless shrinking away of the tissues on the right side of the face.

Physical Examination.—On admission this well nourished girl appeared essentially normal except for the lesion on the face. She showed an area of alopecia and scleroderma above the right temple in the middle of which appeared an old scar. The skin of the right forehead was paper thin, nonadherent and brownish. Another patch of scleroderma lay beneath the right eye. Discoloration of the skin with atrophy of subcutaneous tissue, muscles, bone and cartilage extended to the midline and vertically down the nose to the chin. The tongue showed atrophy on the right. All cranial nerves were normal to rough tests. The pupils were equal, ocular movements normal and all reflexes normal. Although the distribution corresponded fairly closely to that of the fifth nerve, there was no sensory impairment.

Investigation of Primary Pathologic Change.—On admission the red cell count was 4,280,000, white cell count 4,800, hemoglobin level 85 per cent and smear negative. The basal metabolic

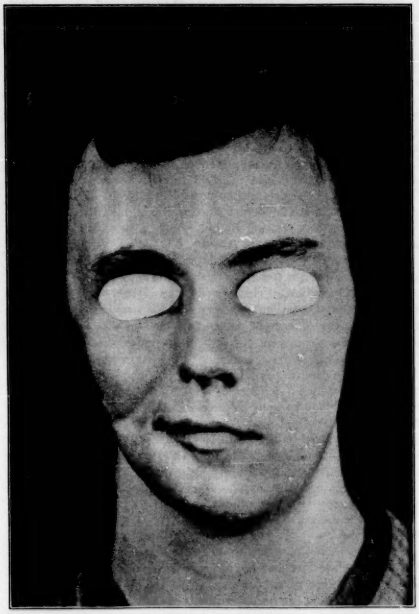

Fig. 9 (case 2).—Appearance Oct. 6, 1939, showing that a certain amount of resorption, especially of the transplants to the eyelids, has taken place. Otherwise the contour of the face is fairly satisfactory.

rate July 16 was —18 and when repeated —29. Spinal fluid examination gave a total protein of 32 mg., sugar 745 mg. and colloidal gold 0000000000, the Wassermann test was negative and there were no cells. The electrocardiogram was normal.

The skin temperature taken July 20 on contrasting points on opposite sides of the face was lower on the affected side, being

from 92 to 94 F. on the right and from 93 to 95.5 F. on the left. After procaine hydrochloride block of the right semilunar ganglion, the readings were from 95 to 95.5 F. on this side.

The skin temperature recorded three years later, however, appeared to show that the affected side was warmer than the other. Preganglionic sympathectomy, therefore, apparently was not indicated, nor was an arterial stripping operation.

Blood chemistry studies showed that sugar, urea nitrogen, nonprotein nitrogen, cholesterol and calcium levels were all essentially normal.

The patient was given one fourth grain (0.016 Gm.) of thyroid three times a day with no improvement.

X-ray study of the skull showed a rather broad and shallow sella turcica, no definite erosion of the clinoids, and no evidence of disease of sinuses. The chest plate showed an increased density of the bronchial tree, with questionable evidence of healed apical tuberculosis.

Biopsies of comparable areas from both sides of the face were examined. In the abnormal piece no subcutaneous fat nerves were seen, in contrast to the small nerve fibers running through the fat in the control specimen. Sweat and sebaceous glands and smooth muscle, however, were present in the abnormal piece, although not as plentiful as on the unaffected side. The blood vessels appeared to be similar in the two pieces.

Treatment of Local Manifestations.—On August 1 daily injections of 1 cc. of solution of posterior pituitary were started. After four months of almost constant treatment, the discoloration was less and the quality of the skin was definitely improved.

Treatment of Final Deformity.—On readmission July 15, 1937, there was found to have been no progression of the atrophy (fig. 6).

First Operation, July 23: A 2 inch incision was made anterior and inferior to the tragus on the right. The cheek was undermined toward the corner of the mouth. A second incision half an inch long was made above the hairline over the right temple, and a tunnel was undermined down to the superior edge of the zygoma. A thick split graft was then removed from the anterior surface of the left thigh, and a full thickness of lower dermal layer, fat and fascia was excised *en bloc*. The transplant was divided and threaded into the two tunnels previously prepared. Through and through stitches were used to maintain its position. The rectangular defect of the thigh, measuring about 2 by 3 inches, was closed by swinging a pedicled flap from adjacent tissue under some tension.

On readmission six months later, Feb. 21, 1938, very little resorption of the graft had taken place (fig. 7).

Second Operation, February 24: A large split graft was removed from the right thigh and a block of tissue including the lower layer of dermis, fat and fascia lata was excised. The dermal-fascial graft was cut into cubes measuring 1.5 cc. each. Through a small incision anterior to the right tragus the superficial tissues were undermined to the corner of the mouth and this tunnel was filled with transplants. A second incision lateral to the mandibular symphysis allowed other cubed transplants to be inserted above and below the angle of the mouth. The thigh wound was closed with plastic incisions. The grafts were not sutured in place. Immobilization of the face and jaw was obtained with elastic bandages.

On readmission six months later, September 14, the transplants appeared to be holding well.

Third Operation, September 15: After removal of a block of tissue from the left thigh, including fascia, fat and dermis, cubes of this tissue were packed into two areas, one beneath the angle of the jaw and the other beneath the lower lid extending to the bridge of the nose.

On readmission six months later, March 24, 1939, the grafts showed little resorption (fig. 8).

Fourth Operation, March 25: Through a 2 inch incision above the right parietal region, the atrophic discolored skin of the right side of the forehead was completely undermined to the eyebrow. A thin plaque of fascia carrying a small amount of fat was carefully spread in this undermined area and held securely with through and through stitches at the corners. Smaller grafts of fat and fascia were inserted through small incisions above and below the right palpebral fissure. The eyelids were sutured together and released ten days later.

Examination October 6 showed that the most recent graft of fat to the orbital region had undergone considerable resorption. The older grafts to the region of the cheek as well had lost some of their substance. The result at this time, however, more than two years from the first operation, showed a reasonably satisfactory improvement in general contour (fig. 9).

SUMMARY

Treatment of facial hemiatrophy may be divided into three phases: the investigation of the primary pathologic change, therapy directed toward improving the local lesions and finally surgical correction of the resultant disfigurement.

In surgical reconstruction with fat, fascia and dermal grafts, in six cases of hemiatrophy, we have found certain points of value. Two cases—the earliest followed for fifteen years—emphasize some of these points.

CONCLUSIONS

1. Facial hemiatrophy is a self-limited condition, the etiology of which is obscure.
2. Reconstruction of the final deformity through the use of autogenous tissues is of value.
3. Considerable absorption of all types of free transplants takes place over a period of time.
4. Dermal grafts and fascia are found to maintain the necessary bulk better than fat transplants.
5. The results of plastic reconstruction in hemiatrophy of the face utilizing dermal grafts and fascia are definitely worth while.
6. In one case there was gradual but marked resorption of fat and fascia grafts over a period of fifteen years. It is felt that there is less chance of similar results with dermal grafts.

475 Commonwealth Avenue.

DERMATITIS FOLLOWING THE WEARING OF NYLON STOCKINGS

PRELIMINARY REPORT OF FOUR CASES

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A new commercial product brings with it the possibility that it may be antigenic to some one. On May 15, 1940, the long heralded Nylon hosiery appeared on the market. Within a period of one month I encountered four patients with severe acute dermatitis in the stocking distribution following the wearing of Nylon hose of one particular brand. Patch tests so far made suggest that the finish or the dye of the stockings rather than the Nylon yarn may be the cause of the dermatitis. Further tests wait upon the cooperation of the manufacturers. This note is made so that others may be on the lookout for similar cases and to call attention to the need, for the manufacturers, to warn the public of the possibility of reactions to this product.

REPORT OF CASES

CASE 1.—Mrs. M. W., aged 30, a housewife, consulted me on May 27, 1940. One week after wearing Nylon stockings for the first time she developed a severe pruritic folliculopapular eruption involving the lower extremities from the toes to the upper third of the thighs, where it stopped abruptly. On May 28 the legs and thighs became edematous and the papules had become tense vesicles. Shortly thereafter the follicular lesions spread to the buttocks, abdomen, arms, face and neck. With four weeks of bed rest, wet dressings, soothing lotions and sedatives the process gradually subsided, although eight weeks after the onset involution had not yet been complete. Patch tests

gave strongly positive erythematous vesicular reactions to a piece of the stocking which had been worn. A test with an undyed piece of Nylon fabric yielded a negative reaction. Patch tests with the residue of an ether extract of the finished stocking were positive.

CASE 2.—Mrs. F. H., a school teacher aged 33, reported that she had worn Nylon stockings for about a week and then developed an itching eruption of the legs and thighs. On examination there was a diffuse papular follicular eruption confined to the legs and thighs. Practically every hair follicle was involved. The eruption was intensely pruritic and was slow to disappear. Three weeks after its onset on the legs a papulofollicular eruption appeared on the forearms and neck. Patch tests made with the stockings which the patient had worn produced an erythematous follicular papular reaction in twenty-four hours. Patch tests with undyed Nylon were negative after forty-eight hours. Patch tests with the residue of an ether extract of the finished stocking gave a positive reaction.

CASE 3.—Mrs. Y. M., aged 30, a housewife, wore Nylon stockings for two days and developed an itching eruption of the thighs and legs. The eruption was erythematopapular and confined to the hair follicles. Patch tests were positive to the stockings which had been worn but negative to undyed Nylon. A patch test with an ether extract of the finished stocking was strongly positive.

CASE 4.—Miss L. B., aged 30, a saleslady, seen through the courtesy of Dr. Louis Cheskin, wore Nylon stockings for three days after shaving the legs and developed a pruritic folliculovesicular eruption of both legs and thighs. Soothing applications had little effect on the eruption but it gradually subsided in two weeks. Patch tests gave strongly positive reactions to the stockings which had been worn and negative reactions to the undyed Nylon. A patch test made with the residue of an ether extract of the finished stockings was strongly positive.

COMMENT

In all four cases here reported the stockings which caused the dermatitis were confined to one particular brand. In a personal communication the E. I. DuPont de Nemours Company stated that Nylon yarn is manufactured by it and sold to various mills, where the material is made into hosiery and then dyed and finished. It is understood that the same dyes are used for Nylon as are used for cellulose acetate material. According to Schwartz and Tulipan,[1] hosiery is often finished by treating with a softening agent such as a sulfonated oil, a soap or an oil emulsion. From the follicular nature of the eruption in each of the four cases it might be deduced that the offending agent was dissolved on the skin in perspiration and was absorbed through the hair follicles. These cases suggest that the dye or the finish is probably a primary cutaneous irritant.

CONCLUSIONS

1. Four cases of dermatitis of the legs and thighs followed the wearing of Nylon stockings made by one manufacturer.

2. Patch tests in all four cases gave strongly positive reactions to the finished product and to the residue of an ether extract.

3. Patch tests made with undyed and unfinished Nylon were negative.

4. These cases suggest that the dye or finish used in preparing the hose in question may have been a primary cutaneous irritant, while the Nylon itself is probably innocuous.

31 Lincoln Park.

1. Schwartz, Louis, and Tulipan, Louis: A Text Book of Occupational Diseases of the Skin, Philadelphia, Lea & Febiger, 1939, p. 402.

EXCISION OF PHEOCHROMOCYTOMA

FOLLOWING NEAR FATAL ATTACK OF PAROXYSMAL HYPERTENSION

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AND
ELEANOR HUMPHREYS, M.D.
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Benign neoplasms arising from the medulla of the adrenal gland or of similar structure but occurring outside the gland in the retroperitoneal space are being reported with increasing frequency. In 1934 Belt and Powell [1] reviewed thirty-six reported cases, and by 1939 one of us (E. H.) was able to collect 103 cases in the literature. Most of the reports deal with postmortem observations. In 1922 Labbé, Tinel and Doumer [2] first described the clinical syndrome caused by these growths. In 1926 Vaquez, Donzelot and Geraudel [3] were the first to make a clinical diagnosis of such a neoplasm and advise operation. The patient refused this and the diagnosis was confirmed later at necropsy.[4] Charles Mayo [5] was the first to remove successfully such a neoplasm causing the typical syndrome, but at the moment the

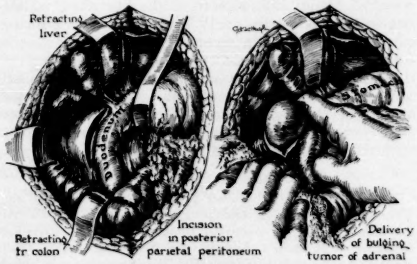

Fig. 1.—Semidiagrammatic illustration of excision of a pheochromocytoma in the right adrenal gland.

true nature of the tumor was not appreciated. The case reported by Pincoffs and Shipley [6] in 1929 was the first instance of correct preoperative diagnosis, successful excision and prolonged survival of the patient.

The clinical syndrome caused by these growths is referred to as the adrenal-sympathetic or adrenal-medullary syndrome and may be briefly characterized as follows: In a previously healthy person there suddenly appear attacks of giddiness, weakness, blanching and pallor of the extremities, tachycardia, headache, precordial pain, often nausea and vomiting and partial or complete syncope. Blood pressure readings taken during the attacks show an increase of 100 mm. of mercury or more in the systolic pressure and marked increase in the diastolic pressure. There may or may not be hyperglycemia and glycosuria. The attacks last for from sev-

From the Departments of Surgery, Medicine and Pathology, the University of Chicago.

1. Belt, A. E., and Powell, T. O.: Clinical Manifestations of the Chromaffin Cell Tumors Arising from the Suprarenal Medulla, Surg., Gynec. & Obst. **59**: 9 (July) 1934.

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4. Vaquez, Henri; Donzelot, Edouard, and Geraudel, Emile: Le surrénalome hypertensif, Presse méd. **37**: 169 (Feb. 6) 1929.

5. Mayo, C. H.: Paroxysmal Hypertension with Tumor of Retroperitoneal Nerve, J. A. M. A. **89**: 1047 (Sept. 24) 1927.

6. Pincoffs, M. C.: A Case of Paroxysmal Hypertension Associated with Suprarenal Tumor, Tr. A. Am. Physicians **44**: 295, 1929.

eral moments to several hours. Once developed they usually increase in frequency, may or may not appear to follow emotional or physical strain, or may be induced by bending the body in a certain direction. Fatal collapse may result from any one attack, especially if the attack appears to be induced by some trauma or emotional strain. It has been generally assumed that the attacks are due to sudden liberation of epinephrine or epinephrine-like substances into the circulation by the tumor, which thus retains at least this much of the function of normal adrenal medulla. This point has finally been actually demonstrated by Beer, King and Prinzmetal.[7]

Fig. 2.—Appearance of the specimen. A spherical tumor bulged from each surface of the adrenal gland (*A*).

Since 1927 there have appeared in the literature reports of a number of successful surgical removals of these neoplasms, and in 1938 MacKenzie and McEachern[8] collected fifteen instances from the literature, adding one case of their own. In 1938 we also reported such a case.[9] Our purpose in recording the following case is to cite again the feasibility of successful removal of these neoplasms which, if not diagnosed and left untreated, result sooner or later in death from the attacks of severe circulatory disturbances which they engender. They are thus benign from the morphologic standpoint but physiologically malignant.

REPORT OF CASE

Mrs. F. H., a white woman aged 43, was admitted to the Medical Service of Dr. George F. Dick Sept. 24, 1935. At this time there were no serious complaints, and the following diagnoses were made: infected tonsils, simple goiter, small uterine fibroids and cervicitis. The blood pressure was noted as 130 systolic, 80 diastolic. She was readmitted to the hospital April 25, 1939, stating that she had had a thyroidectomy in September 1937 and felt quite well for the next six months but that in June 1938 she began to have attacks of severe headache and that in November 1938 an attack was characterized by severe headache, backache and "kind of unconsciousness." Another such attack occurred about Dec. 25, 1938, and again in February 1939. On April 20, 1939, the severity of the attack was extreme, being followed by a state of collapse which, when observed by the family physician in attendance, led to the pronouncement of death. As was his custom when his patients appeared to have just died, he administered an intracardiac injection of epinephrine. This was followed by a return of pulse and respiration; shortly thereafter, because of marked rales, the patient was "turned upside down" and a "quart of fluid" drained from the lungs. On admission the blood pressure was 140 systolic, 85 diastolic.

The patient was observed in the hospital until May 7, when at 3 p. m. she complained of nausea, vomited and had severe back pain, tachycardia, labored respiration and cyanosis. The intern called to see her observed the blood pressure to be 295 systolic, 155 diastolic, and pulse rate 160. In about one hour the attack passed off, the blood pressure falling to 160 systolic, 110 diastolic.

A diagnosis of paroxysmal hypertension due to pheochromocytoma was made and operation advised. Because of the previous near fatal attack, retroperitoneal pneumograms were not deemed advisable.

On May 9, under procaine hydrochloride spinal anesthesia later supplemented by ethylene, the abdomen was entered through a high midline incision. The result of manual exploration was negative except for the right adrenal gland, which appeared to include a spherical, rather firm tumor mass about 4 cm. in diameter. The posterior parietal peritoneum was incised along the outer curvature of the upper portion of the second part of the duodenum, permitting retraction of the latter to the left. The tumor-bearing adrenal was then removed by blunt dissection (fig. 1). After hemostasis the posterior parietal peritoneum was closed and then the abdominal incision by interrupted silk sutures.

At the onset of the operation the blood pressure was 120 systolic, 60 diastolic. During manipulation of the tumor and its removal with the right adrenal the pressure rose to 270 systolic, 120 diastolic, and at the termination of the operation fell to 100 systolic, 60 diastolic. Venoclysis of physiologic solution of sodium chloride (1,500 cc.) was begun as soon as the tumor was removed. Convalescence was uneventful; the temperature was highest, 100 F., on the second and third days and normal thereafter. The pulse remained between 80 and 90 beats per minute. The patient has been seen on several occasions since discharge on May 24, 1939, and has remained well. The blood pressure is 100 systolic, 70 diastolic.

Pathologic Study: The gross appearance of the tumor is shown in figure 2. It weighed 13.5 Gm. Microscopic examination shows a typical pheochromocytoma, many cells of which reveal the positive "chromic reaction" (fig. 3).

A bio-assay by Dr. Louis Leiter on the anesthetized dog, comparing the rise in blood pressure following injection of a hydrochloric acid extract of a known quantity of tumor with the rise produced by known quantities of epinephrine, revealed the epinephrine content of the tumor to have been approximately 2.2 mg. per gram.

Fig. 3.—Section of the pheochromocytoma, showing typical large polyhedral cells with hyperchromatic nuclei and finely granular cytoplasm; slightly reduced from a photomicrograph with a magnification of 1,300 diameters.

COMMENT AND SUMMARY

Increased experience with the successful removal of pheochromocytomas of the adrenal producing paroxysmal hypertension emphasizes the importance of early

7. Beer, Edwin; King, F. H., and Prinzmetal, Myron: Pheochromocytoma with Demonstration of Pressor (Adrenalin) Substance in the Blood Preoperatively During Hypertensive Crises, Ann. Surg. **108**: 85 (July) 1937.

8. MacKenzie, D. W., and McEachern, Donald: Adrenal Pheochromocytoma: The Syndrome of Paroxysmal Hypertension, Tr. Am. A. Genito-Urin. Surgeons **31**: 127, 1938.

9. Brunschwig, Alexander; Humphreys, Eleanor, and Roome, Norman: The Relief of Paroxysmal Hypertension by Excision of Pheochromocytoma, Surgery **4**: 361 (Sept.) 1938.

diagnosis to permit surgical excision prior to fatal collapse, which sooner or later ensues in patients with such neoplasms.

In the reported successful operations the manner of approach was about equally divided between abdominal and lumbar incisions. In our opinion the abdominal incision appears preferable because of the frequent inability to localize the tumors accurately prior to operation. Of the 103 reports (mostly of necropsies) reviewed in the literature forty-three concerned the right and thirty-four the left adrenal; there were thirteen instances of tumors in each adrenal, and in thirteen instances the neoplasms were entirely outside the adrenal glands.

950 East Fifty-Ninth Street.

TYPES OF BURIED GRAFTS USED TO REPAIR DEEP DEPRESSIONS IN THE SKULL

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NEWARK, N. J.

This paper embodies the clinical experience obtained from plastic operations on fifteen patients with depressions in the skull of varying degree. In seven of the cases there had been brain abscess or meningitis and the dura had been opened widely at the time of operation, exposing the brain. In three of the cases there was osteomyelitis of the frontal bone and the bone had been removed, exposing the dura, but the dura itself was not opened. In the remaining five cases there were depressed fractures of the frontal bone with the dura uninjured or only slightly lacerated.

Nine of the fourteen cases, from the standpoint of deformity, presented large depressions in the frontal region due to the removal of the bony brow, one or both frontal sinuses and an adjacent area of frontal bone. The remaining six cases exhibited less extensive depressions resulting from the removal of smaller areas of bone above the frontal sinuses or from the removal of a single bony brow. In none of the infected cases were depressions repaired until the wound had remaned completely healed for a period of two years.

The two essentials for the repair of depressions in the skull are an adequate cutaneous covering and a satisfactory filling substance to replace the absent bone.

CUTANEOUS COVERING

The scalp skin was present in all of my cases although frequently separated by wide areas of scar tissue covered by a thin layer of epidermis. This was particularly true in the infected cases where the dura had been incised with subsequent herniation of the brain through the dural opening. A covering of skin was provided in these cases by first carefully dissecting the thin layer of epidermis from the underlying scar tissue covering the brain. Pulsations from the frontal lobe immediately beneath the layer of scar tissue sometimes made this procedure slow and difficult. The retracted scalp skin at the margin of the wound was then widely undermined and sutured to cover the defect completely. In a few cases it was necessary to form flaps of the scalp skin in order to obtain proper relaxation over the exposed area.

Read before the annual meeting of the Society of Plastic and Reconstructive Surgery, Philadelphia, during November 1938.

With a satisfactory covering provided there remained the much more difficult problem of selecting a suitable substance to insert beneath the skin overlying the depression. This suggests a discussion of the types of grafts used for burial beneath the skin.

FOREIGN SUBSTANCES

Many foreign substances have been buried beneath the skin to fill depressions in the skull and nose for the purpose of improving a person's appearance. These foreign substances include ivory, animal bone, silver and gold plates and paraffin. Unfortunately the human body resents the presence of foreign material, and when it is used there occurs a slow but progressive action in the surrounding host tissue which eventually results in expulsion of the implant. There are cases, it is true, in which foreign implants have remained in place for years, but local trauma or infection seems to remind the body of their presence and precipitate their removal. The harmful sequelae following the use of paraffin are well known, and its former wide application is now very generally condemned.

DERMAL GRAFTS

(Skin dermis with the epidermis removed). Loewe [1] and Rehn advocated the use of dermis as a buried graft in plastic operations prior to 1914. Rehn,[2] however, first applied it clinically in the treatment of postoperative hernia. Eitner [3] in 1920 described a method of elevating a depression in the face by inserting a section of de-epithelized derma beneath the skin overlying the depression. Either omitted reference to the earlier work of Rehn and Loewe. Vilray Blair and J. B. Brown used dermal grafts and described the method to Straatsma,[4] who successfully used the graft to repair saddle nose. Smith [5] has used the dermal graft to repair saddle nose in a large number of cases and feels that in many respects it is superior to cartilage.

One would suppose, theoretically, that cyst formation might occur from hair follicles, sebaceous glands or sweat glands in the buried section of dermis. In order to determine the fate of these structures I buried sections of dermis and fat beneath the chest skin of human beings and removed them at intervals of seven days to one year.[6] Examination of the sections of the implanted dermis showed that sebaceous glands and hair follicles completely disappeared. The sweat glands were present in the one year section but showed definite degenerative changes. Remnants of epidermis incompletely removed from the dermis at first formed small cyst cavities, but in the later sections these were entirely absent. From this evidence one may conclude that dermis is a good filling substance, since both the epithelial elements in the dermis and small remaining portions of epidermis tend to degenerate and disappear. Dermal grafts also become part of the living organism after transplantation and remain as living tissue.

To repair defects in the skull the dermal grafts can best be taken from the thigh, including the underlying fat and fascia lata. The epidermis is first shaved off

1. Loewe, O.: München. med. Wchnschr. **24**: 1320, 1913.
2. Rehn, E.: München. med. Wchnschr. **1**: 118, 1914. Rehn, E., and Miyauchi: Arch. f. klin. Chir. **105**: 1, 1914.
3. Eitner, E.: Ueber Unterpolsterung der Gesichtshaut, Med. Klin. **16**: 93 (Jan. 25) 1920.
4. Straatsma, C. R.: Use of the Dermal Graft in the Repair of Small Saddle Defects of the Nose, Arch. Otolaryng. **16**: 506 (Oct.) 1932.
5. Smith, Ferris: Personal communication to the author.
6. Peer, L. A., and Paddock, Royce: Histologic Studies on the Fate of Deeply Implanted Dermal Grafts, Arch. Surg. **34**: 268-290 (Feb.) 1937.

with a sharp Thiersch knife, and a pattern of dermis, fat and fascia lata is removed from this area. When a large graft is required two segments are removed and sutured together to form a complete pattern. Some absorption occurs in the fat layer over a period of time, but the graft adapts itself remarkably well to the rounded contour of the skull. Where one desires to reconstruct a ridge such as a bony brow or bridge of the nose, cartilage is more desirable than dermal graft.

Fig. 1.—Cadaver rib cartilage graft preserved in alcohol for one month and buried beneath the chest skin of a female patient. The cartilage graft was removed after twenty months and sectioned. Note invasion of cartilage by numerous strands of connective tissue.

The dermal graft is indicated, therefore, to fill shallow depressions in the skull but is not suitable for the repair of a deep depression. In my series of fifteen cases the only two failures occurred where large dermal grafts were used which became infected after operation. The infected areas were drained early, but in both cases drainage continued until all of the dermal graft was extruded or removed with an instrument. The infections then promptly subsided. One of these failures was later successfully repaired by autogenous rib cartilage, but in the other case further operation was refused. Both infections were localized in the soft tissues of the scalp and did not lead to cerebral involvement.

RIB CARTILAGE PRESERVED IN ALCOHOL

Human cartilage preserved in alcohol was used rather extensively a generation ago to fill depressions in the nose. The procedure was discarded because of the belief that the grafts either suppurated or were absorbed and replaced by fibrous tissue. Recently there has been a revival of the method, and Pierce and O'Connor,[7] J. B. Brown, Straith, Straatsma and I, among others, have used preserved human cartilage grafts to fill depressions about the face and skull. Since all of the observations concerning the fate of these cartilage grafts were purely clinical, I buried sections of human pickled cartilage beneath the chest skin of other human beings and removed these grafts at intervals varying from seven days to two years.[8] Histologic examination in the seven and eight day sections showed an early reaction in the host tissue surrounding the implants. There were numerous collections of giant cells, polymorphonuclear leukocytes and large and small round cells. A thick connective tissue capsule formed very early about the cartilage implant, walling it off from the adjacent host tissues. This reaction lasted about one month and then disappeared to a large extent. The cartilage grafts remained as tolerated dead foreign bodies until the end of the nine and one-half month period. From nine and one half months till two years after implantation the sections showed progressive invasion of the cartilage implant by fibrous tissue and partial absorption of the cartilage. From this experimental evidence one may conclude that pickled cartilage grafts undergo a slow, gradual invasion and absorption and hence are not as satisfactory a filling substance as fresh autogenous cartilage. However, when the patient will not consent to the removal of his own costal cartilage one may use fresh cadaver cartilage preserved in 50 per cent alcohol. The preserved cadaver cartilage is also useful in children where their own costal cartilage does not possess sufficient bulk to fill a deep skull defect or when the patient's age or general condition precludes a long operation. My procedure is to remove the cartilage from alcohol and place it in physiologic solution of sodium chloride one hour before operation. The cartilage is then removed from the saline solution and inserted in a subcutaneous pocket beneath the abdominal skin, the wound is closed and firm pressure dressing is applied to prevent bleeding. If the patient tolerates the cartilage in the abdominal tissues it is removed at a later operation and inserted beneath the forehead skin to fill out the depression. I always hoard the cartilage first to be sure that the patient will retain the foreign graft before placing it beneath the scalp. The pickled cartilage is surprisingly resistant to infection. I have had two infections at the abdominal

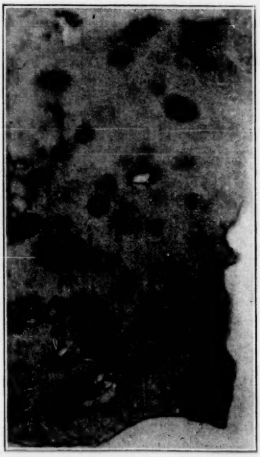

Fig. 2.—Autogenous rib cartilage graft buried beneath the chest skin of a human being for five years and ten months. Note complete absence of invasion by connective tissue and normal appearance of cartilage. (The specimen was sent to me for section and microscopic examination by Dr. Claire Straith.)

7. Pierce, G. W., and O'Connor, G. B.: Ann. Otol., Rhin. & Laryng. **47**: 437-452 (June) 1938. (Pierce and O'Connor originated the revival of preserved cartilage grafts prior to publication of this article.)

8. Peer, L. A.: Cartilage Transplanted Beneath the Skin of the Chest in Man, Arch. Otolaryng. **27**: 42-58 (Jan.) 1938.

site of transplantation which healed promptly after drainage without loss of the graft. One must use care to remove all muscle, fascia and perichondrium from the graft before transplantation because the soft tissues of one individual when transplanted into another frequently give rise to considerable reaction. The cartilage cells embedded in the hyaline matrix do not come into contact with the surrounding host tissue to a great extent and hence cause very little irritation.

AUTOGENOUS RIB CARTILAGE

Fresh rib cartilage taken from the patient's chest is probably the most satisfactory tissue with which to repair skull defects. It retains its contour, is readily shaped as desired and is not subject to absorption. Like dermal grafts, fresh autogenous cartilage grafts become part of the living organism and remain as living tissue until the individual dies. Experimental studies at the Newark Eye and Ear Infirmary [9] with sections of fresh autoplastic cartilage grafts in human beings show that the cartilage retains its normal structure as living tissue after transplantation. This conclusion is based on

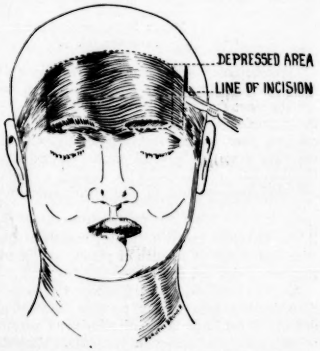

Fig. 3.—Deep depression in the frontal region.

microscopic examination of segments of costal cartilage buried beneath the chest skin of human beings and removed at intervals of six months, nine months, eleven months, seventeen months, eighteen months, two years, four and one-half years and six years.[10]

When repairing a large skull defect the surgeon may shorten the operative procedure by doing the operation in two or three stages. Thus in the forehead a rib cartilage segment, suitably shaped, may be inserted to fill out the brow during the first operation. At a later time additional cartilage may be inserted to elevate the depression above the reconstructed brow. Deep depressions may require two or three thicknesses of cartilage placed one on top of the other to obtain the desired elevation. The operator should use meticulous care to elevate only the skin and not carry his dissection into the brain substance. Epinephrine hydrochloride packs during the operation and a firm dressing over the grafted area will control bleeding and lessen the danger of infection. Rib cartilage after transplantation without its perichondrium does not decrease or increase in size. It is, however, subject at times to distortions such

Fig. 4.—Releasing scalp skin over the depressed area.

as twisting or bending. In such cases one can easily insert a scalpel through a small incision and remove the projecting portion of cartilage. Living autogenous cartilage is very resistant to infection. One of my recent patients with an extensive depression in the

Fig. 5.—Insertion of rib cartilage.

frontal region contracted pneumonia following the insertion of a large autogenous cartilage graft. During the course of his pneumonia the cartilage graft became infected and after incision drained for three months. The cartilage, however, remained in place, and when the patient was last seen, two years after operation, the graft appeared to have the same gross bulk as when first inserted. On the basis of clinical experience and

9. Peer, L. A.: The Fate of Living and Dead Cartilage Transplanted in Humans, Surg., Gynec. & Obst. **68**: 603-610 (March) 1939.

10. Dr. Warren Davis recently sent me stained sections of an autogenous costal cartilage graft buried with its perichondrium and removed thirteen years after transplantation. A small outer portion of this graft showed definite invasion by connective tissue. The larger bulk of the graft showed no invasion or absorption and the cartilage cells appeared normal. It is quite possible that the small area of cartilage invaded in Davis's graft was injured at the time of transplantation and the invading process represents an effort at removal and replacement of the devitalized cartilage.

from experimental evidence showing that autogenous cartilage survives after transplantation, I prefer this type of graft above all others that I have used.

BONE GRAFTS

A discussion of bone grafts will be omitted since they were not used in this series of cases. Carter,[11] Kazanjian,[12] Webster,[13] Sheehan[14] and many other excellent clinicians have used bone grafts successfully for various types of depressions.

Fig. 6.—Position of rib cartilage, front view.

A questionnaire sent to sixteen surgeons with considerable experience in this type of work revealed the following opinions: Seven men used only autogenous rib cartilage for cranial defects. Two men used only autogenous bone for cranial defects. Seven used autogenous bone for deep defects and autogenous cartilage for shallow defects. Five of the sixteen sometimes used preserved costal cartilage and two used dermal grafts for shallow defects.

SUMMARY

1. Dermal grafts, pickled cadaver cartilage and living autogenous cartilage were used in the repair in fifteen cases of skull depression.

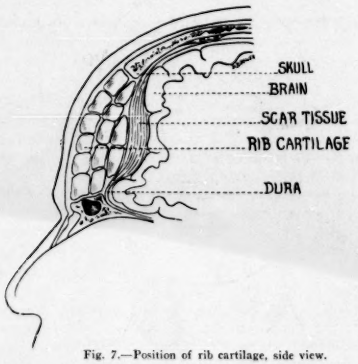

Fig. 7.—Position of rib cartilage, side view.

2. Dermal grafts are satisfactory for shallow depressions but tend to become infected more frequently than cartilage grafts. When infection occurs the dermal graft will probably be lost.

3. Pickled cadaver cartilage is indicated with patients who will not consent to the removal of their own rib cartilage and with small children. It may also be used when the patients age or general condition contraindicates a long operation.

4. Living autogenous cartilage taken from the patient's chest is the most satisfactory tissue with which to repair skull depressions.

965 Broad Street.

11. Carter, W. W.: The Treatment of Fractures and Depressed Deformities, Laryngoscope **18**: 683-691 (Sept.) 1908; The Ultimate Fate of Bone When Transplanted into the Nose, Arch. Otolaryng. **15**: 563-573 (April) 1932.

12. Kazanjian, V. H., and Converse, J. M.: Reconstruction After Radical Operation for Osteomyelitis of the Frontal Bone, Arch. Otolaryng. **31**: 94-112 (Jan.) 1940.

13. Webster, Jerome P.: Personal communication to the author.

14. Sheehan, J. Eastman: A Manual of Reparative Plastic Surgery, New York, Paul B. Hoeber, Inc., 1938, pp. 223-225.

Clinical Notes, Suggestions and New Instruments

ACUTE THROMBOPENIC PURPURA TREATED SUCCESSFULLY WITH SOLUTION OF PARATHYROID

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AND
HENRY MICHELSON, M.D.
PATERSON, N. J.

Thrombopenic purpura has been treated by a variety of agents, without consistent results. Blood transfusion and splenectomy[1] are the most favored procedures; other measures used include the administration of moccasin snake venom,[2] ascorbic acid, calcium, liver extract and occasionally other substances.[3] In the case reported here all measures, including splenectomy, failed to alter the course of the disease; a spectacular remission followed administration of solution of parathyroid.

REVIEW OF REPORTED CASES

The literature contains detailed reports of five cases treated with large doses of solution of parathyroid in which there were four recoveries and one death.

In 1932 Lowenburg and Ginsburg[4] reported the first case. A white boy aged 5 with purpura haemorrhagica was accidentally given large doses of solution of parathyroid. A total of 600 units was given in six days. Marked hypercalcemia developed, the serum calcium rising to a level of 19.6 mg. per hundred cubic centimeters. Concomitantly the hemorrhagic symptoms disappeared.

In 1936 the same authors presented a second case.[5] A 7 year old white boy was unsuccessfully treated for essential thrombopenic purpura with moccasin snake venom. Solution of parathyroid was administered and hypercalcemia induced, the serum calcium reaching 18.8 mg. per hundred cubic centimeters. A total of 240 units of solution of parathyroid was given in four days. Immediate and spectacular clinical improvement followed, and a cause and effect relationship between the hypercalcemia and the apparent cures was suggested.

From the Surgical Service of Dr. William Spickers, Barnert Memorial Hospital.

1. Whipple, A. O.: Splenectomy as a Therapeutic Measure in Thrombocytopenic Purpura Haemorrhagica, Surg., Gynec. & Obst. **42**: 329 (March) 1926. Brown, D. H., and Elliott, R. H. E.: The Results of Splenectomy in Thrombocytopenic Purpura: A Comparative Study of Ten Cases Treated by Conservative Methods, J. A. M. A. **107**: 1781 (Nov. 28) 1936. Wintrobe, M. M.; Hanrahan, E. M., and Thomas, Caroline B.: Purpura Haemorrhagica, with Special Reference to Course and Treatment, ibid. **109**: 1170 (Oct. 9) 1937.

2. Peck, S. M., and Rosenthal, Nathan: Effect of Moccasin Snake Venom (Aricistrodon Piscivorus) in Hemorrhagic Conditions, J. A. M. A. **104**: 1066 (March 30) 1935. Peck, S. M.; Rosenthal, Nathan, and Erf, L. A.: The Value of the Prognostic Venom Reaction in Thrombocytopenic Purpura, ibid. **106**: 1783 (May 23) 1936.

3. Rosenthal, Nathan: The Course and Treatment of Thrombopenic Purpura, J. A. M. A. **112**: 101 (Jan. 14) 1939.

4. Lowenburg, Harry, and Ginsburg, T. M.: Acute Hypercalcemia: Report of a Case, J. A. M. A. **99**: 1166 (Oct. 1) 1932.

5. Lowenburg, Harry, and Ginsburg, T. M.: Induced Hypercalcemia: Its Possible Therapeutic Relation to Thrombocytopenic Purpura, J. A. M. A. **106**: 1779 (May 23) 1936.

In 1937 Ainsworth, Edelman and Fried[6] reported two additional cases of thrombocytopenic purpura in white girls aged 3 and 4 years. The purpura in one was apparently secondary to a preceding scarlet fever. In the other it followed closely on a diarrhea of unknown origin. Both were given solution of parathyroid, and prompt remission of all clinical symptoms and return of the normal hematologic picture ensued. The 3 year old child received a total of 140 units in three days; the 4 year old girl received a total of 200 units in four days. In both patients the serum calcium remained within normal limits during and after the parathyroid therapy.

In 1937 Mathewson and Cameron[7] reported a single case of purpura in which solution of parathyroid failed to halt the progress of the disease. A white woman aged 26 with epistaxis, profuse menstrual flow and subcutaneous hemorrhages was given solution of parathyroid. A total of 300 units was administered in four days. Although the serum calcium did not rise above normal, the patient exhibited symptoms of parathyroid toxicity —nausea, vomiting and abdominal cramps. In spite of a rise in blood platelets from 100,000 to 290,000 per cubic millimeter the patient made no clinical response. Death resulted from multiple cerebral hemorrhages one week after the parathyroid therapy was begun. In this case the condition cannot be considered thrombopenic purpura in view of the relatively normal platelet count. This may have some bearing on the poor clinical response to solution of parathyroid.

Rosenthal[3] in a recent review of thrombopenia stated that he had observed no beneficial effect on bleeding tendency or platelet count in five chronic and two acute cases, but he gave no further details. In each of the cases just summarized calcium was given together with solution of parathyroid.

REPORT OF CASE

P. L.,[8] a white girl aged 12, began to menstruate at the age of 11. At first the periods occurred every four weeks and lasted seven days. Gradually the interval shortened to three weeks and the flow was prolonged to ten days. For a year, numerous purpuric spots were observed on her skin. On March 15, 1939, profuse vaginal bleeding with the passage of many clots began. She was admitted to the Barnert Memorial Hospital on April 2, still bleeding copiously. No antecedent history of infection was elicited. The family history was noncontributory. There were no siblings. During the three weeks immediately preceding hospitalization she had been given several injections of an anterior pituitary preparation without effect.

On admission the patient appeared well nourished, rather obese, very alert and intelligent and quite cooperative. The temperature was 101 F., pulse rate 120 and respiratory rate 25. There was a pronounced pallor of the skin, lips and conjunctivas. The teeth were well cared for and there was no bleeding from the gums. Examination of the heart, lungs and abdomen was negative. The spleen could not be palpated. On both arms were numerous purpuric areas at the site of the recent injections into the deltoid muscles.

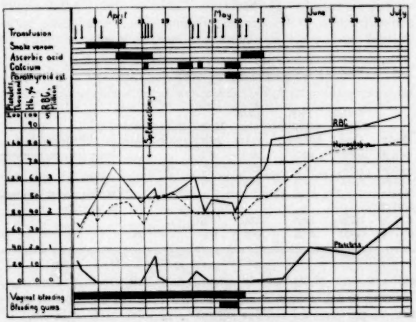
Laboratory examination on admission revealed red blood cells 1,700,000, hemoglobin (Sahli) 25 per cent, platelets 25,000, white blood cells 16,400, polymorphonuclear neutrophils 82 per cent, lymphocytes 16 per cent, monocytes 2 per cent, bleeding time more than twenty minutes, no clot retraction at the end of twenty-four hours, tourniquet test markedly positive in one minute. A diagnosis of acute thrombopenic purpura was made.

A blood transfusion of 250 cc. of citrated whole blood was given directly after admission. Fourteen transfusions were given within the next seven weeks. After two transfusions had produced no effect on the bleeding, the administration of moccasin snake venom was begun on April 6. The initial dose was 0.4 cc. of a 1:3,000 dilution. The dose was increased 0.1 cc. daily to a maximum of 1 cc. Eleven injections were given and then discontinued, as no improvement in the clinical or laboratory evidence occurred. The platelet count fell to zero.

Ascorbic acid was begun on April 15 and continued for eleven days with no discernible improvement.

Splenectomy was performed on April 24. The operation was uneventful and postoperative recovery rapid, but vaginal bleeding continued. The platelets rose to 30,000 per cubic millimeter after splenectomy but within a few days again disappeared from the blood. A bone marrow puncture on May 7 showed the presence of many megakaryocytes without much maturation. On this date the appearance of abdominal pain and nausea suggested the onset of intra-abdominal bleeding. The patient failed steadily. There was a noticeable loss of weight. The appetite was poor and she grew progressively weaker. On May 15, bleeding from the gums began and the patient appeared moribund.

May 17, 50 units of solution of parathyroid was given subcutaneously, and May 18 100 units with no reaction. May 19 the dose of 100 units was repeated. Several hours later she complained of abdominal pain, headache and generalized soreness throughout the body. May 20 the last dose of solution of parathyroid, 150 units, was given. She became extremely irri-



Summary of hemoglobin, erythrocyte and platelet determinations and the treatment given.

table, cried hysterically and complained of numbness in both lower extremities. Nausea and vomiting were present throughout the day. The pulse became weak and occasionally irregular. Blood and clots were passed from the vagina, but the gingival bleeding had stopped.

The following morning, May 21, the patient was still disturbed and almost irrational at times and continued to complain of numbness of the legs. In the evening she seemed transformed—cheerful and bright and more interested in her surroundings. There was no bleeding after this day. The appetite returned, and on May 25 the patient was out of bed and convalescent.

The serum calcium levels were 10.2 mg. per hundred cubic centimeters immediately before the first injection of solution of parathyroid, 9.5 mg. immediately after the last injection, and 9.8 mg. one week later. Ten cc. of calcium gluconate was given intravenously with each injection of solution of parathyroid. Similar doses of calcium had been given previously without effect on the bleeding.

The patient's subsequent course was uneventful. She was discharged from the hospital June 7. No bleeding had occurred since May 21, the day after the last injection of solution of parathyroid. The hemoglobin had risen to 60 per cent and the erythrocytes to 3,800,000. Platelets were still absent from the blood stream.

She has been followed for eleven months with no sign of recurrence. Menstrual periods have recurred at intervals of

6. Ainsworth, M. L.; Edelman, S. D., and Fried, R. I.: Thrombocytopenic Purpura Haemorrhagica: Two Cases Treated with Parathyroid Hormone and Calcium Gluconate, J. Pediat. **11**: 559 (Oct.) 1937.
7. Mathewson, F. A. L., and Cameron, A. T.: An Apparent Instance of Parathormone Inactivity, Canad. M. A. J. **36**: 141 (Feb.) 1937.
8. This patient was seen through the courtesy of Dr. M. S. Joelson.

from twenty-eight to thirty days, lasting four or five days each, with a normal amount of flow. The hemoglobin and erythrocytes are slowly approaching normal levels, but two months after discharge the platelets numbered only 75,000.

In the chart are summarized the hemoglobin, erythrocyte and platelet determinations and the treatment given. In the table the remaining blood data are summarized.

COMMENT

Although thrombopenic purpura often exhibits periods of exacerbation and spontaneous remission, we do not believe the remission in this case to have been spontaneous or coincidental. All measures used including splenectomy failed to arrest the bleeding. Repeated transfusions were insufficient to sustain the patient. The condition was grave. The sudden and sustained improvement which followed the administration of solution of parathyroid seems to indicate the specificity of the agent in this case.

The exact nature of the action of parathyroid in these cases awaits clarification. The administration of large doses of solution of parathyroid alters the state of equilibrium of the calcium of the body. The participation of calcium ions in blood clotting by direct activation of prothrombin has long been established.[9] According to Peters and Van Slyke,[10] from 40 to 50 per cent of the normal serum calcium is held in solution through the action of parathyroid hormone. This is the physiologically active fraction of the serum calcium. Theoretically the parathyroid may exert its effect by increasing the solubility of

Summary of Blood Tests

Date	White Blood Cells	Polymorphonuclears	Lymphocytes	Monocytes	Basophils	Eosinophils	Bleeding Time
4- 2-39	16,400	82%	16%	2%	...	...	More than 20 minutes
4- 8-39	7,200	64%	30%	5%	1%	...	
4-25-39	8,100	62%	30%	5%	...	2%	
5- 1-39	.....	....	....	...	...	...	More than 30 minutes
5-26-39	.....	....	.....	...	...	...	18 minutes
6- 1-39	9,200	34%	63%	3%	...	...	
6-17-39	8,800	49%	40%	5%	...	6%	

calcium and phosphate in serum and body fluids. Hastings, Murray and Sendroy[11] demonstrated that the addition of solution of parathyroid enables serum to dissolve more calcium.

Lowenburg and Ginsburg[5] suggested that the hypercalcemia observed in both their cases might have brought about their apparent cures. However, in none of the subsequent cases, including our own, is the presence of hypercalcemia reported. It would seem more likely that some qualitative change occurring in the physicochemical state of the blood calcium rather than a purely quantitative increase is responsible. Although the blood calcium remains at its normal level, it may be made more available for the clotting cycle by the action of the parathyroid hormone.

SUMMARY

1. A successful instance of the use of solution of parathyroid in thrombopenic purpura is added to the four other successful cases and one unsuccessful case previously reported.

2. Our patient is older than those mentioned in previous reports, with the exception of the patient described by Mathewson and Cameron, for whom solution of parathyroid was ineffective.

3. A total of 400 units of solution of parathyroid in four days was given after splenectomy had failed.

4. Dramatic recovery occurred of an apparently moribund patient.

647 Broadway—557 Broadway.

9. Howell, W. H.: A Textbook of Physiology, ed. 7, Philadelphia, W. B. Saunders Company, 1918, p. 459.

10. Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Chemistry, Baltimore, Williams & Wilkins Company, 1932, vol. 1, pp. 810-820.

11. Hastings, A. B.; Murray, C. D., and Sendroy, Julius, Jr.: Studies of the Solubility of Calcium Salts: I. The Solubility of Calcium Carbonate in Salt Solutions and Biological Fluids, J. Biol. Chem. **71**: 23 (Feb.) 1927.

HEMATURIA FROM SULFATHIAZOLE THERAPY IN PNEUMONIA

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The tendency of sulfapyridine to form urinary crystals resulting in hematuria and even obstruction is by this time well known. Gross, Cooper and Scott[1] have collected from the literature thirty-six cases of gross hematuria, with seven in which uroliths were specifically mentioned, complete bilateral ureteral block being disclosed at autopsy in one instance.[2] Plummer and McLellan[3] have reported two cases of unilateral calculus formation, one of which was fatal. Arnett, Shoup and Henry[4] have reported a case of bilateral ureteral obstruction with recovery. The fact that similar complications can arise in the course of sulfathiazole therapy is now beginning to be recognized. Gross, Cooper and Scott[1] have demonstrated concretions in the kidneys of rats receiving sulfathiazole, and Pepper and Horack[5] reported the death of a 77 year old pneumonia patient who developed hematuria and oliguria while on sulfathiazole therapy. At autopsy the kidneys were found to be large and soft and their collecting tubules were dilated and contained crystalline material. In the case here reported severe hematuria and lumbar pain were present but the patient recovered.

REPORT OF CASE

L. E., a woman aged 72, residing in Christ Church Hospital, a home for aged women, had been receiving digitalis for auricular fibrillation, which began in February 1940 incident to hypertensive cardiovascular disease of many years' standing. On April 13, 1940, pain developed in the chest. On the following day early signs of pneumonia were noted at the base of the left lung, the leukocyte count was 13,700, rusty sputum appeared and the temperature was 99.6 F. On April 15 the signs of pneumonia became unequivocal, and at 8 a. m. 2 Gm. (30 grains) of sulfathiazole was given, followed every four hours by half this amount of the drug and an equal quantity of sodium bicarbonate. The temperature varied between normal and 100 F., the respiratory rate was 28 and the patient's condition remained satisfactory. The appearance of the urine was noteworthy; previous to sulfathiazole medication it had been clear, acid in reaction and free from sediment, with only an occasional hyaline cast and a few leukocytes, and when it was boiled gave a heavy cloud of albumin. On April 16 it was acid and had a muddy appearance with abundant brownish sediment which separated readily on centrifugation. The sediment proved on microscopic examination to be composed almost entirely of the dumb-bell, rosette and chestnut-burr shaped crystals so frequently found during the course of sulfathiazole therapy. Blood culture gave negative results. The sputum contained micrococci of the catarrhalis group, staphylococci and Streptococcus viridans but no pneumococci in smear or on culture. The blood sulfathiazole was 6 mg. per hundred cubic centimeters.

On April 17, after a total of 14 Gm. of sulfathiazole had been taken in forty-eight hours, the urine became extremely bloody and the patient complained of intense pain in the lumbar region. Deep percussion over the left kidney was painful. The urinary output, which had been 960 cc. on the previous day, was 570 cc. plus an unknown quantity which was lost with defecation. The blood pressure was 150/100. Sulfathiazole was stopped and 900 cc. of 5 per cent dextrose in physiologic solution of sodium chloride was administered by vein. The sulfathiazole level of the blood at this time was 7 mg. per hundred cubic centimeters.[6] On the following day the lumbar

1. Gross, Paul; Cooper, F. B., and Scott, R. E.: Urolithiasis Medicamentosa, Urol. & Cutan. Rev. **44**: 205 (April) 1940.

2. Tsao, Y. F.; McCracken, M. E.; Chen, Ji; Kuo, P. T., and Dale, C. L.: Renal Complications in Sulfapyridine Therapy, J. A. M. A. **113**: 1316 (Sept. 30) 1939.

3. Plummer, Norman, and McLellan, Frederick: The Production of Sulfapyridine: Renal Calculi in Man, J. A. M. A. **114**: 943 (March 16) 1940.

4. Arnett, J. H.; Shoup, G. D., and Henry, N., to be published.

5. Pepper, D. S., and Horack, H. M.: Crystalline Concretions in the Renal Tubules Following Sulfathiazole Therapy: Widely Patent Foramen Ovale in a Patient Aged 77, Am. J. M. Sc. **199**: 674 (May) 1940.

6. The sputum, blood culture and blood chemistry work here reported was done by Dr. William P. Belk, director of the Pathological Laboratory of the Episcopal Hospital.

pain had subsided, the urine was slightly less bloody, although it was still full of blood cells and crystals, and the patient's general condition was improved. Convalescence continued slowly, the characteristic crystals disappearing from the urine on April 20 and the erythrocytes on April 22, on which date the blood urea nitrogen and blood count were normal. Nausea and occasionally vomiting were annoying before, during and after the period of disease and were apparently not affected by diet or the administration or discontinuance of digitalis, sulfathiazole or other therapeutic measures. Throughout the course of the disease, however, this complication interfered somewhat with the free ingestion of fluids. With this exception convalescence was satisfactory though slow, the chest being free from abnormal signs and the patient up much of the day by the middle of May.

COMMENT

It is the currently accepted belief that sulfathiazole, like sulfapyridine, may produce hematuria mechanically through the irritation caused by the crystals precipitated in the renal tubules and pelves. No doubt the fact that in the present case, because of vomiting, it was impossible to maintain a sufficiently high fluid intake to prevent such precipitation was an important factor in causing the hematuria. The fact that such a complication may arise should not discourage the medical profession from using sulfathiazole, which is probably less toxic and more efficacious in cases of pneumonia than sulfapyridine. In 200 cases of pneumonia, half of which were treated by the former and half by the latter drug, Flippin, Schwartz and Rose [7] report only one case of gross hematuria, and this occurred in the sulfapyridine group, while the mortality in the sulfathiazole group was lower by 3 per cent and vomiting was much less frequent. The point that should be emphasized is the importance of maintaining a sufficiently high fluid intake to prevent massive crystal formation. The fluid intake and urinary output should receive the watchful attention of the physician, and the urine should be examined at least daily for crystals and blood. If the intake can be kept in excess of 3,000 cc. and the output at 1,500 cc. or more a day, and if the drug is immediately discontinued and intravenous fluids are administered with the first appearance of lumbar pain or bloody urine, the dangers from renal complications will be reduced to a minimum.

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GRANULOMATOUS TUMOR FOLLOWING INTRAMAMMARY INJECTION OF COLLOIDAL THORIUM DIOXIDE

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Recent studies in the roentgenographic demonstration of tumors of the breast after injection of the ducts with an opaque medium have aroused considerable enthusiasm. It is not generally appreciated, however, that this diagnostic procedure may produce untoward reactions of considerable moment.

Mammography was first suggested by Ries,[1] of Chicago, who in 1930 reported one case in which iodized poppyseed oil was injected intraductally. This was unfortunately followed by abscess formation. No other studies of similar nature were made by any one until 1937, when Hicken and his associates [2] reported the use of this method in fifty-six cases, using colloidal thorium dioxide in most instances. Hicken's study suggested that by this method it might be possible to differentiate localized from infiltrating growths, solid from cystic tumors, and simple retention cysts from cystic degeneration of the breast. He felt that it was especially valuable in determining the location, number and size of papillomatous tumors. The contraindications to injection were given as frankly malignant growths and acute infections.

Of the various mediums used—colloidal thorium dioxide, lipoiodine, hippuran, diodrast, bismuth oxychloride, sodium iodide (15 per cent) and air—colloidal thorium dioxide appeared

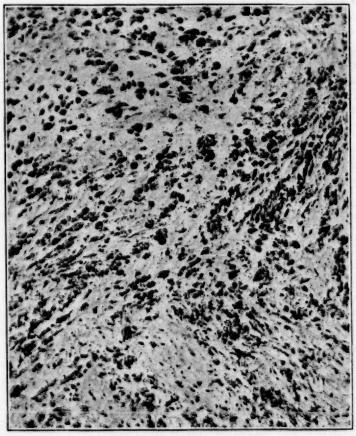

Fig. 1.—Low power magnification. Masses of cells with cytoplasmic inclusions of granular deposits.

to be the least irritating and most suitable because its fluidity permitted the filling of the smallest ducts and yet was of sufficient density to cast a satisfactory shadow. Hicken and his associates felt there was little danger in using colloidal thorium

Fig. 2.—High power magnification. Histiocytes are loaded with the foreign substance (colloidal thorium dioxide), none of which is seen in the interstitial tissue.

dioxide because the injection was intraductal and not intravenous, the quantity injected was small, the mammary ductal system had low absorptive powers, and the substance used (thorotrast, a stabilized 25 per cent solution of colloidal thorium dioxide) could be removed from the ducts by lavage with phys-

7. Flippin, H. F.; Schwartz, Leon, and Rose, S. B.: The Comparative Effectiveness and Toxicity of Sulfathiazole and Sulfapyridine in Pneumococcic Pneumonia, Ann. Int. Med. **13**: 2038 (May) 1940.

From the Department of Surgery, University of Illinois College of Medicine, and the Mount Sinai Hospital.

1. Ries, Emil: Diagnostic Lipiodol Injection into Milk Ducts Followed by Abscess Formation, Am. J. Obst. & Gynec. **20**: 414 (Sept.) 1930.

2. Hicken, N. F.: Mammography: The Roentgenographic Diagnosis of Breast Tumors by Means of Contrast Media, Surg., Gynec. & Obst. **64**: 593-603 (March) 1937. Hicken, N. F.; Best, R. R.; Moon, C. F. and Harris, T. T.: The Preoperative Visualization of Breast Tumors, J. A. M. A. **108**: 864-867 (March 13) 1937. Hicken, N. F.; Best, R. R., and Tallman, J. P.: Mammographic Recognition of Intracystic Papilloma of the Breast, Am. J. Surg. **36**: 611-617 (June) 1937.

iologic solution of sodium chloride followed by evacuation with a breast pump. In 350 injections Hicken had only two mishaps, each consisting of multiple abscesses following injections in the presence of acute mastitis.

Colloidal thorium dioxide is a dangerous substance, dangerous because of its most important characteristic, radioactivity. A recent editorial [3] points out the hazards of using this substance and calls attention to the fact that the disintegration products of thorium emit alpha rays more penetrating than those of the radium series and that this ray is about 10,000 times as toxic to tissues as the gamma ray which is used therapeutically. Small quantities of thorium dioxide will produce marked local tissue changes. Selbie [4] injected 1.3 cc. of this substance into the flank of each of sixty rats. He found that the thorium dioxide had remained localized in firm yellow nodules, which on microscopic study showed many macrophages that had ingested the drug in the form of highly refractile yellow granules. After fifteen months definite tumors were found in fourteen of the sixty rats, each such tumor being a spindle cell sarcoma. Two of the disintegration products of thorium are mesothorium and radiothorium, the two main constituents of luminous paints, which produced fatal poisoning in dial painters as the result of ingestion.

Recent reports by several observers (using Hicken's technic) have indicated the frequency of untoward results following the use of thorium dioxide. Romano and McFetridge [5] studied twenty-five cases in twenty-three of which some surgical procedure was required. In thirteen of the twenty-three cases the mammographic diagnosis agreed with the clinical and pathologic diagnoses. In the other cases the diagnosis was not clear or was actually incorrect. In four cases the injections gave rise to foreign body reactions, three of which were very severe; in two of the three cases amputation of the breast would have been necessary because of the reaction had it not already been planned for the primary lesion. In an experimental study Romano and McFetridge noted foreign body reactions in 50 per cent of the animals used, reactions similar to those seen in women. The reaction was of the foreign body type with periductal infiltration with leukocytes, large phagocytic cells filled with refractile granules of the injected substance, and in late cases actual necrosis. Romano and McFetridge concluded that the method as now employed does not contribute diagnostic aid of sufficient value to warrant risks of serious reactions.

Sowers and Masson [6] record a case of extensive fat necrosis requiring mammectomy which followed injection of colloidal thorium dioxide.

Ries and Mesirow [7] report that three patients suffered considerable pain and tenderness of the breast following injections of colloidal thorium dioxide. Follow-up roentgenograms showed the substance in the lactiferous ducts for as long a time as ten months after the original injection. Two patients required operation for relief. The retained thorium dioxide caused a marked foreign body reaction—macrophage infiltration, giant cell formation, connective tissue hyalinization and necrosis.

In my own case, a similar reaction was produced:

REPORT OF CASE

F. S., a white woman aged 40, married, had an intraductal injection of colloidal thorium dioxide in another hospital thirteen months prior to admission to the Mount Sinai Hospital. Six months after the injection she first noted a small tender mass just inferior and lateral to the left nipple. This gradually increased in size, and when she was first seen, thirteen months after the injection, a small firm sensitive mass was found, about 1.5 cm. in diameter. There had been no discharge from the nipple, and no axillary glands were palpable.

The mass was excised; grossly, it was firm and yellow-brown and appeared to be sharply circumscribed. It measured 15 by 10 mm. Microscopic examination disclosed large masses of oval and polygonal cells with small dark nuclei surrounding areas of hyalinized connective tissue. The cytoplasm was loaded with a granular material having a glistening appearance. This material was present mainly within the cells, although some was present in the interstitial tissue. Around these deposits of foreign material were occasional small islands of mammary parenchyma in groups of ducts surrounded by cells loaded with the substance just mentioned. Accumulations of large masses of endothelial cells and endothelial giant cells were noted in one area. The pathologist reported an isolated area with a granuloma; in most areas there were the manifestations of a very intensive process of phagocytosis by histiocytes of a foreign substance.[8]

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3. Potential Hazards of the Diagnostic Use of Thorium Dioxide Sol, editorial, J. A. M. A. **108**: 1656 (May 8) 1937.

4. Selbie, F. R.: Experimental Production of Sarcoma with Thorotrast, Lancet **2**: 847-848 (Oct. 10) 1936.

5. Romano, S. A., and McFetridge, E. M.: The Limitations and Dangers of Mammography by Contrast Mediums, J. A. M. A. **110**: 1905 (June 4) 1938.

6. Sowers, B. F., and Masson, J. C.: Mastitis Following Use of Thorium Dioxide: Report of Case, Proc. Staff Meet., Mayo Clin. **12**: 529 (Aug. 25) 1937.

7. Ries, R. A., and Mesirow, S. D.: Studies in the Evaluation of Mammography, J. A. M. A. **110**: 1900-1905 (June 4) 1938.

8. Pathologic report by Dr. Israel Davidsohn.

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Special Clinical Article

THE TOXIC MANIFESTATIONS OF SULFANILAMIDE AND ITS DERIVATIVES

WITH REFERENCE TO THEIR IMPORTANCE IN THE COURSE OF THERAPY

CLINICAL LECTURE AT NEW YORK SESSION

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It has become increasingly evident as time goes on that physicians often hesitate to use sulfanilamide or its derivatives because of a fear of the toxic manifestations of these drugs, while patients, because of their lack of appreciation of the possible toxic manifestations of this group of drugs, demand that the drugs be administered to them. These attitudes have at times brought about a somewhat peculiar situation.

It has seemed to us that physicians have been "oversold" on the dangers connected with the use of sulfanilamide and its derivatives and that these drugs can be used with greater impunity than has hitherto been considered possible. It is for this reason that we have carefully analyzed the incidence and types of toxic reactions occurring in hospitalized adults, 1,000 of whom were treated with sulfanilamide, 297 with sulfapyridine and 291 with sulfathiazole in the Johns Hopkins Hospital during the past few years. The results of this analysis are shown in the accompanying table.

It is obvious that certain deductions can be made from this group of patients in respect to the frequency and severity of the toxic manifestations of sulfanilamide or its derivatives, and we think that by a careful study of the clinical histories of these patients certain general

conclusions can be drawn regarding the care of patients who are receiving these drugs.

In the first place it is to be noted that nausea and vomiting constitute a problem only as far as sulfapyridine therapy is concerned. We have noted that the more highly integrated the patient is, the greater the chance that nausea and vomiting will occur in the course of therapy with sulfapyridine. In our Negro patients and in children, nausea and vomiting have caused little if any difficulty in the maintenance of therapy, but in the private wards this toxic manifestation has occasionally been a problem of grave importance. When severe nausea and vomiting occur, the fluid intake should be kept at a high level and sodium chloride administered either by mouth or parenterally in order to prevent dehydration and hypochloremia from developing.

Although adequate statistics are not available, it has seemed to us that dizziness is more common in the course of sulfanilamide therapy than when sulfapyridine or sulfathiazole is being used. The recognition that dizziness may occur is of great importance, especially with respect to patients who drive automobiles, perform heavy or light mechanical work, pilot airplanes or conduct other types of vehicles. All ambulatory patients who are receiving these drugs should be warned of the consequences that may arise from attacks of dizziness.

True toxic psychoses due to the drug are fortunately rare, but they may take almost any form; if a maniacal type of psychosis is present the patient should be carefully watched lest harm come to him. In general it is always best to stop the drug when such toxic manifestations arise. Neuritis, either peripheral or central, is fortunately very rare in the course of therapy with sulfanilamide, sulfapyridine or sulfathiazole, but if evidence of this toxic manifestation is noted the drug should be immediately stopped.

Cyanosis, either mild or severe, is very common in the course of treatment with sulfanilamide but is of little importance except possibly in older persons suffering from emphysema or any type of cardiac disease. In the course of treating lobar pneumonia with sulfapyridine we have never noticed that this drug contributed significantly to the cyanosis already present, and indeed we have repeatedly observed that successful chemotherapy was attended by a marked decrease in the degree of cyanosis present. Our experience with sulfathiazole leads us to believe that this drug produces minimal degrees of cyanosis.

Acidosis has not been reported in the course of sulfapyridine or sulfathiazole therapy, and in our experience it has practically been eliminated as a toxic reaction of sulfanilamide therapy by the concurrent use of sodium bicarbonate with each administration of sulfanilamide. We have never seen a clinical example of alkalosis produced by the administration of sodium bicarbonate in the course of sulfanilamide therapy.

Drug fever is an extremely common toxic manifestation in the course of sulfanilamide or sulfathiazole therapy. It may occur at any time from the first to the thirtieth day of treatment, but it is most commonly seen between the fifth and ninth day of treatment. Drug fever may be of three clinical types: a hectic remitting fever accompanied by chills of great severity, a steadily mounting fever and a low continuous fever. We are frequently asked to distinguish between the fever produced by the drug and the fever produced by infection. Since drug fever occurs most commonly from the fifth to the ninth day and since one expects the temperature of adequately treated patients to be normal by the third day, the appearance of fever, when all clinical signs are pointing toward a favorable termination of the disease, should immediately lead one to suspect that the rise in temperature is due to the drug and not to a recrudescence of the infection. Another factor of considerable importance is that when drug fever appears the patient begins to feel bad and almost always complains of headache and generalized malaise.

Simple drug fever in itself is probably not a dangerous toxic manifestation, but it has always seemed best to us to discontinue the drug if it makes its appearance. When the drug is stopped and fluids are vigorously forced, the temperature should return to normal within twelve to seventy-two hours, depending on the rapidity with which the drug is eliminated from the body. The slower the elimination of the drug, the more prolonged will be the fever.

Drug rashes are common in the course of sulfanilamide and sulfathiazole therapy but do not occur very often when sulfapyridine is being used. They may take any form, and we have seen erysipeloid, scarlatiniform, morbilliform, purpuric, erythema multiforme, papular, vesicular, pustular and nodular eruptions. In severe instances (especially if the drug is continued) the rash may progress to an exfoliating dermatitis. Rashes may occur at any time from the first to the thirtieth day of therapy. In a certain number of instances photosensitization of the skin seems to play a role in the production of the rash. For this reason patients who are receiving treatment with sulfanilamide or one of its derivatives should stay out of the sun until at least three days after cessation of therapy. A curious idea has recently become prevalent in this country, namely that patients who have received sulfanilamide or one of its derivatives during the winter should keep out of the sun during the summer. There is absolutely no foundation in fact for this rumor.

Hepatitis characterized by jaundice without anemia and a definite impairment of liver function has occurred in 0.6 per cent of patients who have been treated with sulfanilamide. This toxic reaction may occur early or late in the course of therapy. It has been noted that occasionally it accompanies dermatitis exfoliativa. In our experience the prognosis has been excellent if the drug is stopped immediately and fluids are forced, and as far as we know there has been no permanent impairment of liver function following recovery from this toxic reaction of sulfanilamide therapy. The occurrence of hepatitis in the course of sulfapyridine therapy has been reported, but we have not seen it in our series of patients treated with this drug. As far as we know, hepatitis has not occurred in the course of sulfathiazole therapy, although it is to be expected.

Leukopenia with granulocytopenia may occur early or late in the course of therapy with sulfanilamide or its derivatives. In adults this toxic manifestation is relatively uncommon. We have noted a sharp drop in the leukocytes following a single dose of sulfanilamide in certain cases, and we have also noted that granulocytopenia may not occur until the sixtieth or seventieth day of treatment. Hence one must always be on the lookout for this type of toxic manifestation.

It has been considered best to stop therapy with the drug if this toxic manifestation makes its appearance, but it must also be remembered that as far as we know there have not been any deaths reported from disturbances of the white cells during the first twelve days of therapy with any of these drugs.

Acute agranulocytosis is a rare complication of therapy with sulfanilamide and sulfapyridine and has not yet been reported in the course of therapy with sulfathiazole. This complication has in our experience occurred on the fourteenth or on a subsequent day of treatment with these drugs. The most common time for its appearance is between the seventeenth and the twenty-fifth day, although it may appear as late as the fortieth day of treatment. For this reason it is very important to check the white blood cell count at daily intervals on and after the twelfth day of treatment with sulfanilamide or its derivatives. If the white blood cell count drops and the polymorphonuclear leukocytes are decreased, it probably means the beginning of acute agranulocytosis. The drug should be stopped and fluids vigorously forced in order that the drug may be eliminated from the body as quickly as possible. Outside of this measure, it is probably unwise to attempt other therapeutic procedures designed to combat the agranulocytosis, except that we believe that it is a good plan to use transfusions when the hemoglobin content falls below 70 per cent. In our experience the prognosis of agranulocytosis occurring in the course of therapy with sulfanilamide and its derivatives is good if the toxic reaction is recognized in its inception.

Mild, slowly developing hemolytic anemia, in which the hemoglobin content drops 20 per cent or more during the first ten days of treatment, has occurred in 3 per cent of the adult patients treated with sulfanilamide. This toxic manifestation is rare in the course of sulfapyridine treatment and has not been reported as yet in patients who are receiving sulfathiazole. In contradistinction to acute hemolytic anemia, it seems to occur as frequently in white as it does in Negro patients. These mild anemias should not be considered as alarming toxic manifestations, as they generally disappear when the drug is stopped and may be combated by the administration of 0.6 Gm. of ferrous sulfate daily. In patients suffering from chronic osteomyelitis or other diseases in which it may be desirable to prescribe sulfanilamide over long periods of time, occasional transfusions will help to control these mild hemolytic anemias.

Acute hemolytic anemias occurred in 1.8 per cent of our adult patients who were treated with sulfanilamide and in 0.6 per cent of those who received sulfapyridine. It has not yet been reported in the course of sulfathiazole therapy. In practically all instances it makes its appearance in the first five days of treatment with these drugs and can almost always be recognized clinically by the sudden development of pallor of the mucous membranes of the mouth and conjunctivas. Mild jaundice almost invariably accompanies this toxic manifestation of drug therapy and is especially noticeable in the scleras. In very acute fulminating cases, hemoglobinemia and hemoglobinuria may be present. Urobilin is consistently found in the urine. We have seen patients whose hemoglobin content has dropped as much as 70 per cent within twenty-four hours when this toxic manifestation has made its appearance.

If possible, it is always best to stop the drug when an acute hemolytic anemia is present. However, in certain cases of severe involvement in which the continuance of therapy has been a life-saving procedure, multiple transfusions have been used in order to maintain the red blood cell count until the critical period

Manifestations of Drug Toxicity Noted in Hospitalized Adults; 1,000 Treated with Sulfanilamide, 297 Treated with Sulfapyridine and 271 Treated with Sulfathiazole

Reaction	Sulfanilamide	Sulfapyridine	Sulfathiazole
Nausea, vomiting	Fairly common	Frequent	Uncommon
Dizziness	Common	Common	Uncommon
Psychoses *	0.6%, occur early	0.3%, occur early	Not reported as yet
Neuritis †	Very rare	Not reported	Not reported
Cyanosis	Very common, early and late	Faint, common, early and late	Uncommon
Acidosis *	1.9%, occurs at any time, rare if soda is used	Not reported	Not reported
Fever *	10%, generally 5th to 9th day, may occur 1st to 30th day	4%, generally 5th to 9th day, may occur 1st to 30th day	10%, generally 5th to 9th day
Rash *	1.9%, may take any form, generally 5th to 9th day, may occur 1st to 30th day	2%, may take any form, 5th to 9th day, may occur 1st to 30th day	5%, nodular type common, may take any form, 5th to 9th day
Hepatitis †	0.6%, early or late	Not seen, but reported	Not reported
Leukopenia with granulocytopenia †	0.3%, early or late	0.6%, early or late	1.6%, early or late
Acute agranulocytosis †	0.1%, occurs 14th to 40th day, common 17th to 25th day	0.3%, occurs 14th to 40th day, common 17th to 25th day	Not reported
Mild hemolytic anemia	3%, early and late	Rare	Not reported
Acute hemolytic anemia †	1.8%, occurs 1st to 5th day	0.6%, occurs 1st to 5th day	Not reported
Hematuria *	Not reported	8%, generally early	2.5%, generally early
Anuria with azotemia †	Not reported	0.3%, generally 1st 10 days	0.7%, generally 1st 10 days
Hyperleukocytosis *	Generally in presence of acute hemolytic anemia	Generally in presence of acute hemolytic anemia	Not reported
Injection of scleras and conjunctivas *	Not reported	Not reported	4%, may occur with rash and fever, 5th to 9th day
Purpura haemorrhagica †	Not seen, but reported	Not seen, but reported	Not reported
Ocular and auditory disturbances *	Rare	Rare	Not reported
Jaundice †	With acute hemolytic anemia or hepatitis	With acute hemolytic anemia or hepatitis	Not reported
Painful joints *	Reported	Not reported	Reported with rash, etc.
Stomatitis *	Rare	Not reported	Not reported
Gastrointestinal tract disturbances *	Bleeding rare, diarrhea uncommon	Rare	Not reported

* Best to stop drug and force fluids. † Imperative to stop drug and force fluids.

of the illness has passed and it is possible to stop the drug. In most instances it has been necessary to administer one or more transfusions to combat this toxic manifestation.

Hematuria has not been reported in the course of therapy with sulfanilamide but is quite frequent when sulfapyridine or sulfathiazole is being used. Hematuria may be either microscopic or gross and may be a precursor of severe renal insufficiency. We have generally considered it best to stop the drug if hematuria makes its appearance, but in several instances we have observed patients in whom hematuria developed and in whom the continuance of therapy did not result in any grave kidney lesion.

Anuria with concurrent azotemia has not been reported in the course of sulfanilamide therapy but has been noted in the course of treatment with sulfapyridine or sulfathiazole. The anuria may be due to a true toxic injury of the tubules of the kidney, probably similar to that seen in mercury bichloride poisoning, or it may be due to the deposition of acetylsulfapyridine or acetylsulfathiazole crystals in the kidney tubules, and on occasion to the blocking of the renal pelves and ureters by calculi composed of acetylsulfapyridine or acetylsulfathiazole.

If anuria makes its appearance, fluids should be forced by mouth and by the parenteral route. If vomiting is present, sodium chloride should be given by mouth or in the form of physiologic solution of sodium chloride by the parenteral route, because it is important to prevent hypochloremia from developing. If the anuria persists for more than twenty-four hours, the ureters should be carefully catheterized, and if obstruction is found an attempt should be made to wash out the ureters and renal pelves gently with warm physiologic solution of sodium chloride in order to remove the renal calculi. If obstruction is not present, fluids should be forced, and in our experience all such patients have eventually recovered from this toxic manifestation of the drug.

Hyperleukocytosis has been seen in this series of cases only when acute hemolytic anemia has been present. We have noticed total white blood cell counts ranging as high as 90,000 cells in the presence of acute hemolytic anemia. These very high white blood cell counts probably represent an abnormal response of the bone marrow to a hurried call made on it by the rapidly developing anemia. In this connection one should always remember that many nucleated red blood cells are being thrown into the circulation and that an allowance should be made for this fact in calculating the total white blood cell count.

Purpura haemorrhagica has not been seen in any of our cases but it has been reported as occurring in the course of therapy with sulfanilamide and sulfapyridine. If this toxic manifestation is noted, the drug should be stopped and fluids forced.

An injection of the scleras and conjunctivas, which may be so severe as to resemble "pink eye," has been noted quite frequently in the course of sulfathiazole therapy. It generally occurs between the fifth and the ninth day of treatment with this drug, and its appearance is often heralded by burning and smarting of the eyes.

Other ocular and auditory disturbances, such as visual and auditory hallucinations and changes in visual and auditory acuity, have been noted in the course of sulfanilamide therapy, but they are rare.

Painful joints have been reported in the course of sulfanilamide therapy, and we have noted that several patients who have received sulfathiazole have had exquisitely tender, swollen joints. This toxic manifestation may be puzzling when the patient is suffering from gonorrhea because of its resemblance to acute gonorrheal arthritis.

Stomatitis has been encountered rarely in the course of sulfanilamide therapy, while unexplained bleeding from the gastrointestinal tract has been seen by us on one or two occasions in cases in which sulfanilamide or sulfapyridine was being administered. One patient who was receiving sulfapyridine had such severe bleeding as to bring about death. Occasionally cases are encountered in which the administration of sulfanilamide produces severe attacks of diarrhea.

COMMENT

It is obvious from this description of the toxic manifestations of sulfanilamide and its derivatives that certain deductions can be made. We believe that, whenever possible, it is wise to utilize every available means of laboratory control in following patients who are receiving sulfanilamide or one of its derivatives. White blood cell counts, hemoglobin and urine examinations should always be done when circumstances permit this type of control. However, we are convinced that, with the exception of acute leukopenia, all the toxic manifestations of sulfanilamide or its derivatives which may occur in the first two weeks of therapy can be recognized by careful clinical observation, and we feel that no physician should hesitate to administer these drugs in therapeutically adequate amounts, provided he can see his patient at least once a day.

At the time the physician visits the patient who is receiving one of these drugs he should inquire as to his symptoms, especially in respect to headache, body aching or malaise, because these symptoms are often the precursors of many of the toxic reactions of sulfanilamide or its derivatives. In addition to an inquiry about symptoms, the scleras should be examined for the presence of jaundice, the mucous membranes for pallor and the skin for evidences of rash. The temperature should always be taken in order to detect whether drug fever is present, and if the patient says that he has been having chills and at the time that it is taken the temperature is normal, arrangements should be made to have the temperature taken frequently during the next twenty-four hours in order to determine whether or not fever is present.

No special precautions have to be observed in respect to the urine of patients who are receiving sulfanilamide, but it is highly important that the urine of patients who are receiving sulfapyridine or sulfathiazole be measured daily. This does not mean that the attendants or family of the patient have to record the urine volume in cubic centimeters or ounces, but any standard measure, whether it is only cups, will suffice. As a matter of fact, in the case of infants it would probably be satisfactory to record the number of voidings daily. In this way it is possible to detect an oliguria which may herald an approaching anuria. The daily examination of the urine under these circumstances should consist of a careful examination of a fresh specimen for gross blood, and at the same time instructions should be given to the patient's attendants to stop the drug and administer fluids in large quantities if the urine looks bloody.

Finally, one should always remember that if a patient has once had drug fever, rash, hepatitis, leukopenia,

acute hemolytic anemia, injection of the scleras and conjunctivas, diarrhea or purpura haemorrhagica in the course of therapy with sulfanilamide or its derivatives he is very likely to have a second, earlier and more severe toxic reaction if the drug is administered a second time. Therefore it is highly important to determine whether or not a patient has previously had a toxic reaction in the course of therapy with one or the other of these drugs. If he gives a history of a toxic reaction in the group which we have just enumerated, it is best to give a small test dose of the drug (0.3 Gm.) and observe the patient carefully over a period of twelve hours before cautiously beginning the course of therapy. Patients who have had a toxic reaction caused by one of these drugs may have a similar reaction when another member of the sulfonamide group is prescribed.

Special Articles

REPORT OF THE COMMITTEE ON VISUAL ECONOMICS

The members of the Committee on Visual Economics during the past year have extended their effort toward bringing about a greater uniformity in the administration of compensation laws. A complete review of the compensation statutes and laws of all the states has been made (tables 1 and 2).

Table 1 sets forth the basic factors used by the different states in computing visual disability.

Read before the Section on Ophthalmology at the Ninety-First Annual Session of the American Medical Association, June 13, 1940.

TABLE 1.—*Basic Factors Used in the Various States for Computing Visual Disability*

States	Weeks Compensation for Loss of Use of One Eye	Weeks Compensation for Loss of an Eyeball	Percentage of Average Earnings, the Basis for Compensation	Visual Factors Used in Computations *	Visual Acuity Determined With or Without Correcting Lenses	Statutory Schedule Used	Snellen Notations Which Equal Industrial Blindness	Methods Used for Rating Permanent Partial Disability
Alabama	100	100	50	.....	.....	.....	.....	No adopted method or schedule
Arizona	108	130	50, 55 and 65	.....	.....	.....	.....	No adopted method or schedule
Arkansas	...	...	.....	.....	.....	.....	.....	Compensation statute passed recently
California	No fixed number of weeks		61.75	1, 3, 4	With	Schedule F	Light perception	Special method
Colorado	104	139	50	1, 3, 4	Without	Schedule C	20/190	See table 2, schedule C
Connecticut	208	208	50	1	With	.....	20/200	No adopted method or schedule
Delaware	113	113	50	.....	.....	.....	.....	No adopted method or schedule
Florida	100	100	50, 55 and 60	1, 2, 3, 4	With	Schedule D	20/170	A. M. A. method used
Georgia	100	100	50	?	Without	?	?	No adopted method or schedule
Idaho	120	140	55	1	Without	Schedule D	20/200	See table 2, schedule D
Illinois	120	120	50	1	Without	Schedule B	20/200	See table 2, schedule B
Indiana	150	150	55	?	With	?	20/200	No adopted method or schedule
Iowa	100	100	60	..	.....	.....	.....	No adopted method or schedule
Kansas	110	110	60	1, 2	Without	Schedule A	20/800	A. M. A. method used
Kentucky	100	100	65	1	Without	Schedule D	20/200	See table 2, schedule D
Louisiana	100	100	65	..	.....	.....	.....	No adopted method or schedule
Maine	100	100	66⅔	1	With	Schedule A	20/200	A. M. A. method used
Maryland	100	100	66⅔	?	Without	?	?	No adopted method or schedule
Massachusetts	$500	$500	66⅔	..	.....	.....	.....	No adopted method or schedule
Michigan	100	100	66⅔	..	.....	.....	.....	No award for partial loss
Minnesota	100	100	66⅔	1	Without	Schedule B	20/200	See table 2, schedule B
Mississippi	...	...	....	..	.....	.....	.....	No compensation law; common law applies
Missouri	108	118	66⅔	1, 2, 3, 4	Without	Schedule E	20/480	See table 2, schedule E
Montana	100	120	50 to 66⅔	..	.....	.....	?	No adopted method or schedule
Nebraska	125	125	66⅔	..	.....	.....	.....	No adopted method or schedule
Nevada	108	130	60	1	With	Schedule D	20/200	See table 2, schedule D
New Hampshire	...	...	..	..	.....	.....	.....	No adopted method or schedule
New Jersey	100	100	66⅔	..	.....	.....	20/200	No adopted method or schedule
New Mexico	100	100	55	..	.....	.....	?	No adopted method or schedule
New York	160	160 wks. and $500	66⅔	1	With	.....	20/100	Snellen notations regarded as fractional vision
North Carolina	100	100	60	1, 2, 3, 4	Without	Schedule A	20/360	A. M. A. method used
North Dakota	100	100	66⅔	1	With and without	Schedule A	20/800	A. M. A. method used
Ohio	125	125	66⅔	1, 2, 3, 4	With	Schedule A	20/800	A. M. A. method used
Oklahoma	100	100	66⅔	1, 2, 3, 4	With	Schedule A	20/800	A. M. A. method used
Oregon	$1,000	$1,000	None	1, 2, 3, 4	With and without	Schedule A	20/800	A. M. A. method used
Pennsylvania	125	125	65	..	.....	.....	.....	Uses U. S. Bull. 406, Dept. of Labor
Rhode Island	80	80	50	?	With	.....	20/200	No adopted method or schedule
South Carolina	100	100	50	..	.....	.....	.....	No adopted method or schedule
South Dakota	100	100	55	..	.....	.....	.....	No adopted method or schedule
Tennessee	100	100	50	1	With	Schedule B	20/200	See table 2, schedule B
Texas	100	100	60	?	With	?	Light perception	No adopted method or schedule
U. S. Gov't	160	160	66⅔	1, 2, 3, 4	With and without	Schedule A	20/200	A. M. A. method used
Utah	100	120	60	1	Without	Schedule G	20/230	See table 2, schedule G
Vermont	100	100	50	1	With and without	.....	Light perception	No adopted method or schedule
Virginia	100	100	55	1	Without	Schedule B	20/200	See table 2, schedule B
Washington	$1,080	$1,440	None	1	Without	Schedule A	20/200	A. M. A. method used
West Virginia	132	132	66⅔	1	With	Schedule A	20/400	A. M. A. method used
Wisconsin	250	275	70	1, 2, 3, 4	With and without	Schedule A	20/800	A. M. A. method used
Wyoming	$1,800	$1,800	None	..	.....	.....	.....	No adopted method or schedule

* 1 indicates central visual acuity at 20 feet; 2, central visual acuity at 14 inches; 3, visual fields; 4, muscle function (extra-ocular).

Table 2 sets forth schedules for loss of visual acuity which have been adopted by the designated states. Similar tables were compiled by Dr. Walter Small several years past. These have been revised and brought up to date and are herewith presented by the Committee on Visual Economics.

It may be noted that twenty-one states have adopted statutory schedules for loss of visual acuity, that one state has no compensation law, that one has passed a law which has not been adopted by the electorate, that twenty-five states have no legal schedule and that four states generally use the American Medical Association method but that in these states this has not been legally adopted.

The report of the Committee on Compensation for Eye Injuries was approved by this section and the House of Delegates fourteen years ago and the main principles contained therein are valid: the method for computing visual disabilities evolved therefrom has now become the legal statutory one in eleven states; in many other states in which no method has received legal sanction this method is employed by labor commissions and by ophthalmologists.

In the report we find some omissions, some lack of clarity and some recommendations which have not met with general approval. Therefore the committee recommends:

1. That the committee be continued and that its membership be increased to three.

2. That the committee be requested to revise the report of 1925 and that a revised report be prepared, published and sent to all members of this section one month before the next annual meeting and that the revision be made a matter of special consideration at the meeting in 1941.

Respectfully submitted.

ALBERT C. SNELL, Chairman.
HARRY S. GRADLE.

TABLE 2.—*Percentage Schedules Loss for Various Acuity Notations in Use Among the Different States*

	Kansas Maine N. Carolina N. Dakota Ohio Oklahoma Oregon U. S. Gov't Washington Wisconsin W. Virginia	Illinois Minnesota Tennessee Virginia	Colorado	Idaho Kentucky Nevada Florida	Missouri	California	Utah
Visual Acuity	Schedule A	Schedule B	Schedule C	Schedule D	Schedule E	Schedule F	Schedule G
20/ 20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
20/ 25	4.3%	5.0%	.....	.....	.....	12.5%	.....
20/ 30	8.5%	10.0%	10.0%	5.5%	12.0%	25.0%	5.0%
20/ 33	.....	.....	.....	.....	15.8%	.....	.....
20/ 35	12.5%	.....	.....	.....	.....	.....	.....
20/ 40	16.4%	20.0%	20.0%	11.0%	22.6%	37.5%	10.0%
20/ 45	20.0%	.....	.....	.....	.....	.....	.....
20/ 50	23.5%	25.0%	30.0%	16.5%	31.9%	50.0%	15.0%
20/ 60	30.1%	33.3%	40.0%	22.0%	40.0%	.....	20.0%
20/ 70	36.0%	40.0%	45.0%	27.5%	47.3%	62.5%	25.0%
20/ 80	41.5%	50.0%	50.0%	33.0%	53.6%	.....	30.0%
20/ 90	46.6%	62.5%	55.0%	38.5%	.....	.....	35.0%
20/100	51.1%	75.0%	60.0%	44.0%	64.1%	75.0%	40.0%
20/110	.....	80.0%	65.0%	50.0%	.....	.....	45.0%
20/120	59.1%	85.0%	65.0%	59.0%	72.2%	.....	50.0%
20/130	.....	87.0%	75.0%	63.3%	.....	.....	55.0%
20/140	65.8%	89.0%	75.0%	68.0%	78.5%	.....	60.0%
20/150	.....	91.0%	80.0%	71.5%	.....	.....	65.0%
20/160	71.4%	93.0%	80.0%	77.0%	83.3%	.....	70.0%
20/170	.....	95.0%	85.0%	81.5%	.....	.....	75.0%
20/180	76.1%	97.0%	85.0%	86.0%	.....	.....	80.0%
20/190	.....	99.0%	90.0%	88.0%	.....	.....	85.0%
20/200	80.0%	100.0%	90.0%	90.0%	90.0%	87.0%	90.0%
20/210	.....	.....	95.0%	.....	.....	.....	.....
20/220	83.3%	.....	95.0%	.....	.....	.....	.....
20/230	.....	.....	100.0%	.....	.....	.....	.....
20/240	86.0%	.....	.....	.....	94.0%	.....	.....
20/260	88.3%	.....	.....	.....	.....	.....	.....
20/267	.....	.....	.....	.....	.....	.....	93.0%
20/280	90.3%	.....	.....	.....	.....	.....	.....
20/300	91.8%	.....	.....	.....	.....	.....	.....
20/320	93.2%	.....	.....	.....	97.9%	.....	.....
20/340	94.3%	.....	.....	.....	.....	.....	.....
20/360	95.2%	.....	.....	.....	.....	.....	.....
20/380	96.0%	.....	.....	.....	.....	.....	.....
20/400	96.7%	.....	.....	.....	.....	.....	96.0%
20/450	97.9%	.....	.....	.....	.....	.....	.....
20/480	.....	.....	.....	.....	99.7%	.....	.....
20/500	98.6%	.....	.....	.....	.....	.....	.....
20/600	99.4%	.....	.....	.....	.....	.....	.....
20/700	99.7%	.....	.....	.....	.....	.....	.....
20/800	99.9%	.....	.....	.....	.....	.....	99.0%

Distribution of Iron in the Body.—Iron exists in the body of an adult in the hemoglobin of the red corpuscles and in all the cells of other tissues. The amount contained in the blood is about 3 Gm. That contained in invisible form in other cells has been estimated roughly at 1 to 3 Gm.—MacCallum, W. G.: A Textbook of Pathology, Philadelphia, W. B. Saunders Company, 1940.

THE PHARMACOPEIA AND THE PHYSICIAN

THE THERAPY OF RICKETS

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This is one of the second series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—ED.

Rickets can be prevented and cured in two ways: by irradiation of the skin with ultraviolet rays and by ingestion of vitamin D. How does it happen that the disease yields to two methods of treatment which seem so totally dissimilar? The answer is that, owing to a device of nature, the two lead to the same final result, namely the absorption of vitamin D into the blood. The skin is full of 7-dehydrocholesterol. Active ultraviolet rays, impinging on the skin, convert the 7-dehydrocholesterol, which is the provitamin form of D, into the vitamin form. The vitamin is then absorbed into the blood. If vitamin D is fed, it is absorbed from the small intestine. In the former case the vitamin was manufactured on the surface of the body as the result of chemical action of light; in the latter it entered the alimentary tract ready made.

NECESSARY INFORMATION CONCERNING VITAMIN D

It has now been shown that as many as eleven forms of vitamin D exist.[1] Of these, only two have a practical importance. The first is activated ergosterol, the second activated 7-dehydrocholesterol. Ergosterol is derived from plant sources. It is the form known as viosterol and the one in "metabolized" milk; i. e., milk activated as the result of feeding irradiated yeast to cows.[2] 7-dehydrocholesterol is the one formed in the skin under the action of ultraviolet light [3] and probably also the one formed in milk through irradiation (irradiated milk).[1a] Recent investigations have presented evidence of six different forms of vitamin D in cod liver oil.[1c] It seems probable that the chief of these is 7-dehydrocholesterol. In the oils of other fish which have not as yet been studied by the newer methods applied to cod liver oil, evidence pointing to the existence of two biologically distinct forms of vitamin D has been brought forward,[4] the one behaving like irradiated ergosterol, the other like activated 7-dehydrocholesterol. Naturally all forms of vitamin D are sterols, closely related chemically. For a discussion, the reader is referred to Bills.[5] It is important to know that vitamin D is soluble in oil and most organic solvents but not in water. Bile acids appear to promote the absorption of sterols (Schönheimer, Loeffler and Hummel, cited by Bills [5]). Heymann [6] has reported that bile seems to be necessary for the absorption of vitamin D from the alimentary tract. It is also important to realize that vitamin D is not readily oxidizable and hence is more stable than vitamin A. The original discovery of vitamin D was made as the result of treating cod liver oil by means of oxygen and heat, which destroyed vitamin A but left vitamin D intact.[7] It is far more stable than vitamins C and B_1.

No one knows how vitamin D acts. It has been proved by means of metabolism measurements that it increases the absorption of calcium and phosphorus from the alimentary tract. Evidence has been produced to show that it acts primarily in promoting the absorption of calcium.[8] The absorption of phosphorus appears to be secondary. But undoubtedly vitamin D exerts action in the interior of the body also. It is known that it increases the metabolic rate.[9] When Albright and Sulkowitch [10] injected a phosphate solution intravenously into a patient suffering from intractable rickets, there was considerable increase in retention of phosphorus and a large increase in urinary excretion but the inorganic phosphorus levels in the blood serum remained unaffected. The important point is that the level of inorganic phosphorus in the blood remained the same, as if, in the presence of a vitamin D deficiency, the organism had lost the power to hold the inorganic phosphorus at the normal concentration. Albright and Sulkowitch believe that vitamin D acts directly on the kidney, stimulating the excretion of phosphate, and apparently that its regulatory influence on the blood is brought to pass through a regulation of absorption and excretion. It seems probable that vitamin D involves either directly or indirectly the parathyroid mechanism. The evidence, which is not very satisfactory, rests on the fact that the parathyroid glands are hypertrophied in rickets and infantile tetany (Erdheim; [11] Pappenheimer and Minor [12]). It seems reasonable to expect that it would involve parathyroid function, since the latter affects the calcium and phosphorus metabolism and the cellular mechanism concerned with the growth and destruction of bone.

WHAT IS A UNIT OF VITAMIN D?

The accepted standard unit for expressing the strength of vitamin D, as adopted by the League of Nations Health Organization and by the United States Pharmacopeia, is defined as ". . . the vitamin D activity

From the Harriet Lane Home of the Johns Hopkins Hospital and the Department of Pediatrics of Johns Hopkins University School of Medicine.

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12. Pappenheimer, A. M., and Minor, J.: Hyperplasia of the Parathyroids in Human Rickets, J. M. Research **42:** 391 (June-Sept.) 1921.

of 1 mgm. of the International Standard Solution of irradiated ergosterol found equal to 0.025 micrograms of crystalline vitamin D." This is the international unit (I. U.), accepted as the U. S. P. unit. The Steenbock unit is no longer used and need not be defined. In administering antirachitic agents one should think in terms of units of vitamin D, since that is the only way in which the dosages of the various substances containing vitamin D, which differ from one another so much in volume, can be reduced to a common denominator. For example, 1 teaspoon (4 cc.) of cod liver oil contains approximately 350 units, 1 quart (liter) of reinforced milk 400 units and 1 mg. of calciferol 400,000 units.

VITAMIN D IN FOODS

Vitamin D is contained in only a few foods ordinarily eaten by us, namely certain oily fishes and eggs. Herring, sardines, tuna and salmon, either fresh or canned, are fairly rich in the vitamin, as are also other fishes rarely eaten, such as the lamprey eel, the ray and the menhaden (Daniel and Munsell [13]). Eggs from all sources contain the vitamin. Fish roe is rich in it. Hen's eggs contain such variable amounts that they are not reliable sources. February eggs have been reported as yielding 140 units of vitamin D and June eggs 390 units per hundred grams.[14] Drake [15] states that it requires at least five egg yolks to furnish the vitamin D equivalent of 1 teaspoon of cod liver oil.

The foods that comprise the diet of the average person are almost lacking in vitamin D, since muscle meat, including the fat, kidneys and other glandular organs, fruit, sugar, cereal and vegetables (the leafy ones as well as seeds, bulbs and tubers) contain none or at the most traces. The amount in milk is negligible. Average butter is estimated as containing only 80 units per hundred grams, making its potency about one one-hundredth that of the average cod liver oil. Liver may contain a very small amount but not enough to have any practical value.

One can summarize this by saying that, although the diet may occasionally furnish appreciable amounts of vitamin D, most of the time it furnishes virtually none. The only proper attitude is to regard the diet as being completely devoid of the vitamin.

THE AVAILABLE SOURCES OF VITAMIN D

Cod Liver Oil.—According to the United States Pharmacopeia XI cod liver oil must contain at least 85 units per gram. However, probably all cod liver oil marketed in this country contains at least 100 units per gram. Some of the superior brands may contain two or even four times the official minimum standard. One teaspoon of cod liver oil, 4 Gm., supplies at least, therefore, 400 units. As already mentioned, the vitamin D in cod liver oil is probably chiefly activated 7-dehydrocholesterol.

Cod liver oil is effective in rickets, infantile tetany and also osteomalacia, as was pointed out clearly years ago.[16] It is universally obtainable and safe and in addition contains vitamin A (about 600 units per gram). The great disadvantage of cod liver oil is its fishy taste. Another disadvantage is its lack of concentration. Since it is not practicable to give more than 4 teaspoons (16 cc.) daily, the maximum dosage is limited to 1,400 units. Cod liver oil is amply sufficient to prevent and to cure rickets in almost all instances. The older child or adult will not take cod liver oil because of its unpleasant taste. Infants, however, do not seem to mind the taste, provided the oil is given early and regularly. When the infant refuses cod liver oil, the fault usually lies with the mother or others who by words or actions communicate their feelings. If begun early and given regularly, ordinarily no difficulty is experienced in administration until toward the end of the first year. If the use is allowed to lapse, however, difficulties almost always arise. It is a common experience to find that when the cod liver oil is stopped for the summer its resumption in the fall is impossible. If cod liver oil is aspirated, it may produce lipoid pneumonia.[17] For this reason it is inadvisable to give it to premature infants or infants with a very low vitality.

Many parents object to cod liver oil on the ground that it gives rise to digestive disturbances, especially in summer. The oil rarely does this and can be administered in hot weather without difficulty. However, some infants cannot take it, and in very rare instances hypersensitiveness has been reported.[18] If infants do not readily take cod liver oil, it is wiser to turn elsewhere.

Cod liver oil is best administered from the spoon. It may, however, be floated on orange juice and the two fed with a spoon. It is possible in this way to give as much as 4 teaspoons in a single dose.

Viosterol in Oil.—Viosterol in oil is ergosterol activated by ultraviolet irradiation, dissolved in corn oil or some other bland oil. The United States Pharmacopeia XI requires that 1 Gm. of viosterol in oil shall contain "at least 10,000 units of vitamin D." One drop of viosterol as delivered by the special dropper included in the commercial viosterol package contains 222 units. Since there are variations in the quantity of oil delivered from droppers, the manufacturer supplies droppers which will deliver slightly more than the certified amount. For this reason actual dosage may slightly exceed calculation. Viosterol in oil is a hundred times stronger than standard cod liver oil in vitamin D content. At times its concentration is a great practical advantage.

Viosterol in oil has no taste; consequently no difficulty is encountered in its administration. In the case of the infant, it is best dropped directly into the mouth. It can, however, be dropped on orange juice in a teaspoon and in that way be floated into the mouth. The habit of adding viosterol to the feeding is bad, because a part of it may adhere to the sides of the bottle and be lost. The only disadvantage that viosterol has as compared with cod liver and other fish oils is that it does not supply vitamin A. Viosterol, on account of its tastelessness and concentration, is admirably suited for use by adults and older children.

Viosterol is now manufactured in at least two different ways, one by means of irradiation with short ultraviolet rays (the Steenbock patent), the other by means of bombardment with low velocity electrons (Knudson and Moore; [19] Knudson; [19] McQuarrie, Thompson,

13. Daniel, E. P., and Munsell, H. E.: Vitamin Content of Foods, Miscellaneous Publication 275, United States Department of Agriculture, 1937.
14. DeVaney, G. M.; Munsell, H. E., and Titus, H. E.: Effect of Sources of Vitamin D on Storage of the Antirachitic Factor in the Egg, Poultry Sc. **12**: 215, 1933.
15. Drake, T. G. H.: Personal communication to the author.
16. Trousseau, Armand: Lectures on Clinical Medicine, Philadelphia, Lindsay & Blakiston, 1882, vol. 2, p. 734.
17. Goodwin, T. C.: Lipoid Cell Pneumonia, Am. J. Dis. Child. **48**: 309 (Aug.) 1934.
18. Menagh, F. R.: Etiology and Results of Treatment in Angio-Neurotic Edema and Urticaria, J. A. M. A. **90**: 668 (March 3) 1928.
19. Knudson, A., and Moore, C. N.: Comparison of the Antirachitic Potency of Ergosterol Irradiated by Ultraviolet Light and by Exposure to Cathode Rays, J. Biol. Chem. **81**: 49 (Jan.) 1929. Knudson, A.: Further Studies on Antirachitic Activation of Substances by Cathode Rays, Science **66**: 176 (Aug. 19) 1927.

Stoesser and Rigler [20]). Viosterol made by either process seems to be the same chemically and biologically.

Viosterol (Calciferol) in Propylene Glycol.—Calciferol is activated crystalline ergosterol; in other words, the pure substance. This preparation is really just another form of viosterol. Its special merit lies in the solvent employed. Propylene glycol is soluble in water; hence viosterol in propylene glycol can be mixed directly with the milk. The only disadvantage is the one inherent in viosterol, namely the lack of vitamin A. It is standardized so that its potency corresponds exactly with that of viosterol in oil.

Fish Oils Enriched with Viosterol or Some Other Natural Source of Vitamin D.—Halibut liver oil is far richer than cod liver oil in vitamin A but only four times more potent in vitamin D. If viosterol or some fish oil highly concentrated in vitamin D is added to the halibut oil, it is possible to raise the vitamin D concentration to that of viosterol in oil and in that way obtain a product which is rich in both vitamins D and A. It is important to remember that practically the entire vitamin D content of the product is viosterol, if viosterol is used as the reinforcing agent. The vitamin A content of halibut liver oil is standardized at about 50,000 units per gram. The vitamin D content is exactly the same as that of viosterol. Administration is as described under viosterol in oil.

Fish Oils Naturally Concentrated in Vitamin D.—The oils from different species of fish vary greatly in concentration of vitamins A and D. Some are rich in A, some in D, many in both. The order of fish richest in vitamin D is the Percomorphi.[21] In the preparation of the oil for therapeutic use the manufacturer has combined oils from various species in such a way that the final admixture has a concentration in vitamin D equal to that of viosterol in oil, namely 10,000 units per gram, and a concentration of vitamin A one hundred times that found in cod liver oil, namely 60,000 units per gram. These fish oils have the merit of providing vitamins D and A in high concentration so that both can be administered in doses measured in drops. The taste is fishy but the quantity required is small. Administration is as described under viosterol in oil.

Irradiated Cholesterol.—This is obtained by the ultraviolet irradiation of cholesterol exactly as viosterol is obtained through the irradiation of ergosterol. Its efficiency has been shown to be excellent by several different investigators (Hood and Ravitch;[22] Drake, Tisdall and Brown [23]) and has now been made available under the trade name "Delstarol."

Miscellaneous Preparations of Vitamin D Derived from Either the Fish Oils or Viosterol.—Viosterol is furnished in combination with dicalcium phosphate and the like. Concentrates from the fish oils are combined with carotene. Cod liver oil itself is concentrated and marketed in liquid, capsule or tablet form. The doses are indicated on the labels.

Vitamin D Milk.—Vitamin D can be placed in the milk in three different ways: first by ultraviolet irradiation, second by feeding the cow irradiated yeast and third by adding a concentrate of vitamin D directly. The advantage of incorporating vitamin D in the milk is that it is taken automatically. The disadvantage is that the amount of the vitamin is determined by the milk requirement. In other words, the vitamin D may be insufficient though the milk sufficient. The requirement for vitamin D seems to be dependent on age rather than on weight.

(*a*) Irradiated Vitamin D Milk: Activation is accomplished through exposure to active ultraviolet rays from artificial sources. The irradiation is carried out in such a way that standardization is at 135 international units per quart. Attempts to obtain a higher potency have failed because of the production of an unpleasant taste. As already stated, the form of the vitamin in irradiated milk is probably activated 7-dehydrocholesterol. Irradiated milk is marketed fresh and also in evaporated and dried forms. The latter are standardized so as to have a potency of 135 international units to the reconstituted quart.

(*b*) Metabolized Vitamin D (Yeast) Milk: This is produced by feeding irradiated yeast to the cow. The standardization is 430 units per quart. The form of vitamin D is viosterol, as already stated.

(*c*) Fortified Vitamin D Milk: Vitamin D in the form of a concentrate derived from cod liver oil or the oils of other fishes or viosterol is added directly to the milk. Fortified vitamin D milk is standardized at 400 units per quart. The form of vitamin D in the milk varies naturally with the supplement.

Vitamin D Bread.—This contains 460 units in the form of viosterol per 24 ounce loaf. Six slices a day, or one-fourth loaf, would yield 115 units.

DO THE TWO MAIN FORMS OF VITAMIN D, 7-DEHYDROCHOLESTEROL AND VIOSTEROL, HAVE THE SAME BIOLOGIC VALUES FOR THE HUMAN BEING? DOES THE VEHICLE IN WHICH THE VITAMIN IS DISPERSED INFLUENCE UTILIZATION?

The discovery that cod liver oil, rat unit for rat unit, was far more effective in curing leg weakness in chickens than was viosterol suggested that the two forms of vitamin D used ordinarily in the treatment of rickets might have quite different biologic values. Indeed, Hess, Lewis and Rivkin [24] announced that the activity of cod liver oil and viosterol were different in the case of the human being, one rat unit of cod liver oil accomplishing the work of four rat units of viosterol. Soon afterward Hess, Lewis, MacLeod and Thomas [25] reported that metabolized milk, rat unit for rat unit, was more effective in the cure of rickets in the human being than either cod liver oil or viosterol, the efficiency equivalents being in the neighborhood of 1:1.25:5.2 respectively. In 1933 Hess and Lewis [26] published work which indicated that irradiated milk was even more potent than yeast milk when comparisons were made with viosterol.

More than forty studies [27] have been made in order to determine whether the two forms of vitamin D are

20. McQuarrie, Irvine; Thompson, W. H.; Stoesser, A. V., and Rigler, L. G.: The Antirachitic Potency of Ergosterol Activated by Low Velocity Electrons: Clinical Evaluation, J. Pediat. **10**: 295 (March) 1937.

21. An order or suborder of teleosts, including all or most fishes with spines in their fins, such as the mackerel and bass.

22. Hood, J. S., and Ravitch, Irene: The Antirachitic Efficiency of Irradiated Cholesterol, J. Pediat. **11**: 521 (Oct.) 1937.

23. Drake, T. G. H.; Tisdall, F. F., and Brown, A. G.: A Comparison of the Antirachitic Effect of Irradiated Cholesterol and Cod Liver Oil, J. Pediat. **9**: 421 (Oct.) 1936.

24. Hess, A. F.; Lewis, J. M., and Rivkin, Helen: Newer Aspects of the Therapeutics of Viosterol (Irradiated Ergosterol), J. A. M. A. **94**: 1885 (June 14) 1930.

25. Hess, A. F.; Lewis, J. M.; MacLeod, F. L., and Thomas, B. H.: Antirachitic Potency of the Milk of Cows Fed Irradiated Yeast or Ergosterol: Clinical Test, J. A. M. A. **97**: 370 (Aug. 8) 1931.

26. Hess, A. F., and Lewis, J. M.: An Appraisal of Antirachitics in Terms of Rat and Clinical Units, J. A. M. A. **101**: 181 (July 15) 1933.

27. For the bibliography see Park, E. A.: The Use of Vitamin D Therapy, Preparations in the Prevention and Treatment of Disease, J. A. M. A. **111**: 1179 (Sept. 24) 1938.

equally effective in the case of the human being and whether vitamin D dispersed in milk is superior to vitamin D dispersed in oil. It was necessary to carry out these studies on infants. The task of obtaining an adequate number of reliable comparisons has been exceedingly difficult and a great deal of the work done has been of poor quality. Only generalizations of an uncertain nature can be drawn from the conflicting and confusing data obtained. For practical purposes the vitamin D in viosterol may be regarded as being equal to the vitamin D of cod liver oil. If viosterol is inferior to cod liver oil, rat unit for rat unit, the differences cannot be great. Vitamin D dispersed in milk is more effective than when dispersed in the usual oil menstruums. The three forms of vitamin D milk may be regarded for practical purposes as having equal value, rat unit for rat unit. However, evidence indicates that irradiated milk may be superior. Vitamin D milk having a potency of 400 units per quart will supply enough vitamin D to prevent the majority of full term infants from showing rickets. Evidence suggests, however, that irradiated milk has too low a potency (135 units per quart) to be relied on for this purpose. Four hundred units of vitamin D per quart of milk may be regarded as the minimum concentration in that menstruum for protection of the infant. The subject of the minimum dosage of vitamin D in the oil menstruums, e. g. viosterol in oil and cod liver oil, is so confusing that attempts at generalization are impossible. It is suggested in the case of the fish oils and viosterol that from 800 to 1,000 units daily be regarded as the lowest level that it is wise to employ for protection from rickets.

The rule that the physician should observe in prescribing vitamin D is to give enough to cover any possible requirement. There seems to be no reason to believe that amounts of vitamin D several times the minimum dosage have any deleterious effect.

HOW TO USE VITAMIN D FOR THE PREVENTION OF RICKETS AND INFANTILE TETANY

Since the period of greatest susceptibility to rickets is the first months of life, it is important that full dosage of vitamin D be reached early, certainly by the end of the second month. If cod liver oil is selected, it should be started at the beginning of the third week or at the latest the fourth week with a dose of one-half teaspoon (175 units). This dose can be increased to 1 teaspoon (350 units) after a few days. In the course of the next two weeks it should be raised to 2 teaspoons (700 units). This dosage may be enlarged to 1,000 units (3 teaspoons) or allowed to stand, according to need in the particular case. It is certainly advisable to give 3 teaspoons if for any reason the infant seems to be particularly liable to rickets. The dosage of 700 or 1,000 units should be continued throughout the first year. As much as 700 units should be continued throughout the second year.

If real difficulties in the administration of cod liver oil arise, it is advisable to turn to one of the other preparations of vitamin D. Difficulties often develop during the second year and are almost certain to develop if the administration of the oil is allowed to lapse for a time.

A real danger in the use of cod liver oil is that it may cause lipoid pneumonia if it happens to run down the larynx into the lungs or is aspirated after vomiting. It should not be used if vomiting occurs frequently or if the infant is feeble or unable to swallow well. For the premature infant it is not sufficiently concentrated, and its use is somewhat risky from the standpoint of possible aspiration.

The use of the concentrated fish oils, viosterol in oil, the oils enriched with viosterol or irradiated cholesterol is exactly that advised in the case of cod liver oil itself. The administration should begin in the third or the fourth week, reach a dosage of 350 units in a week's time and by the end of the fifth or sixth week be increased to a dosage of 700 units. Depending on circumstances, this dosage of the vitamin D preparation should be allowed to stand or be increased to 1,000 units daily. This should be continued through the first year. A dosage of at least 700 units should be given during the second year.

The question is often asked if it is advisable to give cod liver oil or other antirachitic preparations during the summer, since in that season exposure to the sun's rays should of itself be sufficient to prevent the development of rickets. If one can be certain that exposure to the summer sun will be adequate, the administration of vitamin D is not necessary. From the practical point of view, however, it is a good plan to continue the vitamin through the summer, provided it is well taken, for the reason that resumption may be difficult or actually impossible.

If some form of activated milk is used as the antirachitic agent, as already indicated, the dosage is fixed not by the requirement of the child but by the amount of milk taken. This may or may not be sufficient to prevent rickets. Even though metabolized and fortified milks are potent enough in vitamin D to prevent rickets from manifesting itself in most children, it is safer to supplement them with at least 350 units of one of the preparations of vitamin D in oil during the first six months of life. If irradiated milk is given, it should be supplemented with vitamin D from some other source throughout the first year. Either metabolized or fortified vitamin D milk will probably supply sufficient vitamin D during the second year. Irradiated milk may be an adequate source of supply, but if doubt exists supplementation is advisable.

The premature infant is especially susceptible to rickets as well as to tetany, and occasional full term infants, especially Negro infants, seem particularly liable to develop rickets. If special susceptibility to rickets exists, the activated milks will not be satisfactory. They may be used, but they should be supplemented with liberal amounts of vitamin D from other sources. It is suggested that treatment be carried on as if the milk did not contain any vitamin D at all. The dosage of vitamin D required may be 5,000, 10,000 units or even more daily. If doses of these magnitudes are employed, one of the highly concentrated fish oils or viosterol in oil must be chosen, because the necessary quantity of cod liver oil would be too large to be taken. Often the physician discovers unusual susceptibility to rickets only when the ordinary preventive treatment proves insufficient. The course to pursue then is to increase the vitamin D until the desired therapeutic effect is obtained. It is suggested that periods of at least three weeks be allowed to elapse between increases, since at least that length of time is necessary for the full effect to declare itself. There need be no fear, however, in increasing the dose 1,000, 2,000 or 5,000 units at a time. Indeed, the increases ought to be made boldly.

The treatment of refractory rickets and the criteria which indicate that the dosage is adequate or exceeded will be given later.

HOW TO USE VITAMIN D FOR THE CURE OF RICKETS

Although the doses of vitamin D which are sufficient to prevent rickets in a given case can be relied on to cure the disease, the cure may take place too slowly. It is better, therefore, to use sufficiently large doses to end the disease abruptly. The vitamin D milks are not sufficiently powerful antirachitic agents when the cure of rickets is at stake. If cod liver oil is employed, the curative dose in the ordinary case of rickets is 1,000 units (3 teaspoons) daily. This dosage, in the form of cod liver oil, the highly concentrated fish oils or viosterol preparations, will bring advanced rickets under control within a period of from three to four weeks in the great majority of cases. If doses larger than 1,000 units are required, it is best to turn to the concentrated preparations of vitamin D. In the case of premature infants, it is sometimes necessary to give as much as from 10,000 to 20,000 units to bring the disease to a complete termination in a short time, and in the case of some older children in whom the rickets is found to be obstinate it may be necessary to raise the dose to 60,000 units daily or even in excess of that amount. In any case, when the rickets has been stopped, as can be determined by means of repeated x-ray films or by measurements of calcium and inorganic phosphorus in the blood serum or, as can often be surmised from clinical examination alone, the dose of vitamin D can be reduced to protection levels. However, in the case of some infants and older children in whom the tendency to rickets seems to be especially highly developed, large doses of vitamin D may be required indefinitely. In the case of premature infants the need for large doses is usually temporary.

HOW TO USE VITAMIN D FOR THE CURE OF TETANY

Since the initial action of vitamin D in some cases is to cause a depression of the serum calcium at the same time that it causes an elevation in the level of the inorganic phosphorus, it is advisable during the first few days of treatment also to give calcium in some form. If calcium chloride is chosen, it is usual to administer from 3 to 4 Gm. as an initial dose. This is to be followed by 1 Gm. four times a day for two or three days and then 1 Gm. twice a day. The administration of calcium can be stopped at the end of a week or ten days. But the vitamin D treatment should, of course, be continued as already described.

PERTINENT FACTS WITH REGARD TO THE RELATIONSHIP OF ULTRAVIOLET LIGHT TO RICKETS

The rays of ultraviolet light which are active in the cure of rickets lie between 313 and 230 millimicrons (Huldschinsky;[28] Hess and Anderson;[29] Sonne and Rekling[30]). When the antirachitic power of individual wavelengths was tested by means of the monochromatic illuminator, it was found that the radiation at 313 millimicrons exerted a slight antirachitic effect, the radiations at 302, 297, 280, 265 and 253 millimicrons exerted a strong effect, those at 248 and 240 millimicrons a feeble effect and those at 237, 220 and 200 millimicrons no antirachitic power whatever. Naturally the radiations which are active in the cure of rickets are those which the provitamin of vitamin D in the skin is able to absorb. It has been found that the provitamin ergosterol, which happens to have been the one extensively studied although not the one present in the skin, absorbs strongly from 305 to 230 millimicrons but probably possesses some absorptive power beyond these limits in both directions.[31]

Sunlight.—Sunlight consists of visible rays varying in length from 380 to 760 millimicrons (39 per cent), invisible infra-red rays from 760 to 50,000 millimicrons (60 per cent), those longer than 4,000 millimicrons amounting to only 1 per cent) and invisible ultraviolet rays from 380 to 290 millimicrons (1 per cent). The distribution of the energy in the solar spectrum is continuous. Of course, the radiations from the sun actually extend far into the ultraviolet spectrum. But the atmosphere that surrounds the earth filters out all radiations which are shorter than 290 millimicrons even under the most favorable atmospheric conditions of summer (Fabry and Buisson;[32] Dorno[33]). In winter the atmosphere does not permit the passage of rays shorter than 306 millimicrons (Dobson and Harrison;[34] Dobson, Harrison and Lawrence;[35] Buisson[36]), as will be explained presently. It is thus seen that the rays of the sun which reach the surface of the earth are at best very poorly represented in the ultraviolet spectrum and in particular in that part of it which is active in rickets.

The interposition of the atmosphere and the movement of the earth around the sun combine to cause a seasonal variation in both the quantity and the quality of the antirachitic radiations which reach the earth's surface. The reason for this is that, if the altitude of the sun is high, the short antirachitic radiations strike the earth more nearly perpendicularly and hence encounter a minimal thickness of atmosphere and sustain a minimal loss through absorption. At the same time their density per unit area is maximal. On the other hand, if the altitude of the sun is low, so that the short radiations strike the earth obliquely, they traverse a greatly increased thickness of atmosphere and suffer a correspondingly great loss through absorption. At the same time their density per unit area is diminished. At best the energy of the short rays at the extreme end of the spectrum, whether in winter or in summer, is very small. The intensity of the summer radiation at 290 millimicrons is reduced from its passage through the atmosphere two million times and possesses only one millionth the strength of the radiation at 315 millimicrons. Measurements in Baltimore revealed that the total energy of the solar radiations between 290 and 315 millimicrons is from twelve to fourteen

28. Huldschinsky, K.: Heilung der Rachitis durch künstliche Höhensonne, Deutsche med. Wchnschr. **45**: 712 (June 26) 1919; Die Behandlung der Rachitis durch Ultravioletttbestrahlung, Ztschr. f. orthop. Chir. **39**: 426, 1920.

29. Hess, A. F., and Anderson, W. T. Jr.: Antirachitic Activity of Monochromatic and Regional Ultraviolet Radiations, J. A. M. A. **89**: 1222 (Oct. 8) 1927.

30. Sonne, Carl, and Rekling, Eigil: Behandlung experimenteller Rattenrachitis mit monochromatischem ultravioletten Licht, Strahlentherapie **25**: 552, 1927.

31. Cox, W. M., Jr., and Bills, C. E.: Antirickетic Substances: On Relation of Isoergosterols to Vitamin D, J. Biol. Chem. **88**: 709 (Oct.) 1930.

32. Fabry, C., and Buisson, H.: A Study of the Ultraviolet End of the Solar Spectrum, Astrophysical J. **54**: 297, 1921.

33. Dorno, C.: Die physikalischen Grundlagen der Sonnen- und Himmelsstrahlung und ihre Anwendung in der Therapie, Strahlentherapie **18**: 721, 1924.

34. Dobson, G. M. B., and Harrison, D. N.: Measurements of the Amount of Ozone in the Earth's Atmosphere and Its Relation to Other Geophysical Conditions, Proc. Roy. Soc. London, s.A **110**: 660, 1926.

35. Dobson, G. M. B.; Harrison, D. N., and Lawrence, J.: Measurements of the Amount of Ozone in the Earth's Atmosphere and Its Relation to Other Geophysical Conditions: Part III, Proc. Roy. Soc. London, s.A **122**: 456, 1929.

36. Buisson, H.: Mesures de l'ozone de la haute atmosphère pendant l'année 1927, Compt. rend. Acad. d. sc. **186**: 1229, 1928; Mesures de l'ozone de la haute atmosphère pendant l'année 1928, ibid. **188**: 647, 1929.

times greater in summer than in winter.[37] It is necessary to think, therefore, of the solar spectrum in the temperate zone as undergoing a periodic expansion and retraction at the ultraviolet end, the expansion reaching its maximum at the summer solstice and the retraction being greatest at the winter solstice. The higher the latitude, the longer is the famine period in antirachitic radiation. At the polar region this famine is complete for the greater part of the year. Conversely, the lower the latitude the shorter the famine period. In the equatorial zone there is no famine, since the lowest altitude of the sun is sufficient to insure throughout the year adequate antirachitic radiation. Clark found that in Baltimore the antirachitic ultraviolet light in sunlight was least in December, began rapidly to increase in February, reached its height in late July or early August and then declined rapidly to its lowest point in December. The quantity of antirachitic radiations in March and October corresponded. This subject has been approached experimentally by exposing rachitic rats to sunlight at different times of the year.[38] During December, January and February it was found that sunlight had a slight but definite antirachitic action; a sharp increase in activity occurred about February 15 which reached the maximum in midsummer, and an equally sharp decrease began about October 15. The antirachitic power of sunlight in midsummer was found to be eight times greater than in midwinter. In Toronto the crucial inclination of the sun, as measured in terms of the antirachitic radiation, was about 35 degrees. This seasonal variation in rickets was first described in 1884.[39]

Diurnal variations in the antirachitic ultraviolet radiations also occur. During the early morning and late afternoon, when the altitude of the sun is low, sunlight does not possess any antirachitic activity. Naturally, the period of the day when sunlight is effective against rickets is longer during the summer than during the winter. At Toronto in June the sun exerted an antirachitic effect from 7:55 a. m. to 4:30 p. m., but on March 6 this marked antirachitic action was present only from 10:37 a. m. to 2:18 p. m.[40] In Baltimore it was found that in the winter there were no antirachitic radiations in direct sunshine after 3 p. m. (Clark).

The ultraviolet radiations of the sun may reach the body either directly or as the result of reflection. The reflected rays are known as sky shine, the direct rays as direct shine. On meeting the atmosphere the solar radiations active in rickets are in part reflected and scattered. The cause of the reflection is to be found in the minute drops of water floating in the atmosphere. An infant placed in the shade is bathed only in sky shine. If placed at the far end of a room in the shaft of sunlight shining through an open window it is bathed only by direct shine. If placed in the direct sunlight outdoors in some unobstructed place which permits reflected rays to come in from the sides, the infant receives both direct and sky shine. To receive all the sky shine, no obstruction can exist between the recipient and the dome of the sky. From the practical point of view, an infant in the shade against a wall receives only 50 per cent of the sky shine. The walls of buildings in cities greatly reduce sky as well as direct shine.

It is important to have some notion of the relative values of sky shine and direct shine as sources of antirachitic rays. In Baltimore in midsummer at noon on clear days the sky shine in the antirachitic range possesses about two thirds the value of the corresponding direct shine; in early spring and fall it has about an equal value and in winter a greater value (Clark). The ultraviolet radiation in sky shine is far more constant than is that of the direct sunshine. Since the reflected ultraviolet rays come from the drops of water in the atmosphere, their intensity may be actually increased by light clouds or haze. Therefore, on a cloudy day the total ultraviolet intensity of sky shine may be far greater than that of direct shine. On the other hand, if the clouds are dense the ultraviolet rays from sky shine also may be greatly reduced. When the altitude of the sun is high the ultraviolet radiation of sky shine is greater and hence the value of sky shine is greatest in summer and at noon. But, because sky shine is reflected light, its ultraviolet rays are transmitted to the earth when the altitude of the sun is too low for the direct radiation to penetrate effectively. Hence in the early morning and late afternoon the ultraviolet in sky shine may be greatly in excess of direct shine. Sky shine does not always but undoubtedly can produce tanning.

Ultraviolet radiation, both direct and indirect, may be reflected from favorable surfaces; for example, water, sand and snow.

Altitude as well as latitude is important in relationship to the transmissibility of the antirachitic ultraviolet radiations. The higher the altitude, the thinner the covering of atmosphere that absorbs the short radiations. In Denver (altitude 5,300 feet, latitude 40 degrees), the theoretical rickets period begins on December 1 and ends on January 17, whereas in Toronto (altitude 300 feet, latitude 44 degrees) it begins on October 15 and ends on February 15.

Foreign particles in the air, such as dust and smoke, act as absorbents of ultraviolet light. The smoke and dust of cities have greatly reduced the amount of ultraviolet light which penetrates to the street. Clothing completely absorbs the ultraviolet radiation of the sun. Theoretically, rayon material may permit the passage of antirachitic radiation.

Both intensity and time factors are concerned with the therapeutic effect of ultraviolet light in rickets. For example, a long exposure to ultraviolet light when little exists may be the equivalent of a short one under more favorable conditions. Clark estimated that in Toronto exposure of approximately twenty minutes to the noon sun in June was equivalent to three or four hours in January.

As stands to reason, the exposure of the entire body or large parts is more effective than the exposure of a small part. It is important to realize, however, that the exposure of the arm alone in a case of rickets is sufficient to cause a general deposition of lime salts (Huldschinsky).

Pigmentation of the skin is nature's method of protecting the dermis. Irradiation if sufficiently intense

37. Clark, J. H.: Annual Variation in the Antirachitic Radiation from Sun and Sky in Baltimore, Am. J. Hyg. **12**: 690 (Nov.) 1930; The Zinc Sulfide Method of Measuring Ultraviolet Radiation and the Results of Three Years' Observation on Baltimore Sunshine, J. Optic. Soc. America **21**: 240, 1931.

38. Tisdall, F. F., and Brown, Alan: Seasonal Variation of Antirachitic Effect of Sunshine, Am. J. Dis. Child. **34**: 721 (Nov.) 1927; ibid. **36**: 734 (Oct.) 1928.

39. Kassowitz, Max: Die normale Ossification und die Erkrankungen der Knochensystems bei Rachitis und hereditärer Syphilis: II. Theil: Rachitis, Vienna, Wilhelm Braumüller, 1882; Tetanie und Autointoxication im Kindesalter, Wien. med. Presse **38**: 97, 1897; ibid. **38**: 139, 1897.

40. Tisdall, F. F., and Brown, Alan: Relation of Altitude of Sun to Its Antirachitic Effect, J. A. M. A. **92**: 860 (March 16) 1929.

and prolonged will cause ulceration of the deeper layers if all pigment is lacking. However, the horny layer of the epidermis is a defense against ultraviolet light, since it absorbs the ultraviolet rays. "The pigment layer is the sun-shade for the dermis as the horny layer is the sun-shade for the epidermis."[41] Radiation is curative of rickets in the Negro in spite of the heavy pigmentation. This indicates the superficiality of the seat of action of ultraviolet light. Ultraviolet light can penetrate the living skin of the rabbit a distance of from 1 to 2 mm.[42]

Window glass removes all radiations shorter than 315 millimicrons. Behind window glass, therefore, sunlight, no matter how rich in active rays, will not exert any antirachitic effect. A variety of substitutes for window glass have been developed, some of which transmit 50 per cent or more of the antirachitic radiations. In an ordinary room, as an object is moved farther and farther away from a window, the area of sky becomes so small that the quantity of reflected rays which can reach the object become virtually nil. Unless an infant, therefore, is placed, practically speaking, against the window itself, he cannot benefit from the reflected rays. The only rays to penetrate the interior of the room through the special glasses are the direct rays. Even if the exposure is the most favorable, the direct rays shine in only for a fraction of the day in a continually shifting shaft of light. Only if a room was constructed entirely of the special glass and placed where the view was open, e. g. on the top of a high building, so that the sky shine could enter from all sides, would the special glass have a considerable usefulness, but in winter it would have very little even so.

ARTIFICIAL SOURCES OF ULTRAVIOLET LIGHT

The artificial sources of ultraviolet light are the quartz mercury-vapor lamp and the carbon arc lamp, both far richer than the sun's rays. The quartz mercury-vapor lamp gives off an emission of infra-red (52 per cent) comparable to that in solar radiation, a much smaller percentage of visible light (33 per cent) and a wealth of ultraviolet light of wavelengths ranging from 310 to 250 millimicrons. Twenty-eight per cent of the total energy lies in the ultraviolet and 6 per cent in wavelengths shorter than 290 millimicrons, the extreme limit of the solar spectrum. The spectrum of the quartz mercury-vapor lamp is discontinuous, though this feature is not a detriment. Strong lines lie at 313, 302, 297 and 255 and weaker lines at 310, 270 and 265 millimicrons.

The carbon arc lamps vary in their emissions according as certain metals, e. g. strontium, nickel, cobalt, cerium, fluorine or iron, are incorporated in the carbon either singly or combined. The radiations are strong in the ultraviolet range between 320 and 230 millimicrons if iron is used; if strontium, in the infra-red. Metals may be combined in such a way as to furnish light of percentage composition not differing greatly from solar radiation.

THE USE OF SUNLIGHT FOR PROTECTION AGAINST RICKETS

In the temperate zone in the summer, sunlight can be relied on to protect against rickets, except in rare instances, provided the child is exposed outdoors. The infant cannot receive too much ultraviolet light from the sun's rays, if the blond who "burns" is excepted. Infants, as they grow older, should be placed outdoors on every suitable occasion and should be allowed to profit by the sky shine, even when direct shine is not available. In the winter, sunlight cannot be relied on for protection from rickets. Indeed it is best to regard winter sunshine as almost devoid of antirachitic rays and hence to substitute other methods of protection. Sunlight in the summer is capable of curing rickets. But it is better not to rely on it for that purpose but to adopt other means which are measurable and certain in their results. These other means are the administration of vitamin D, as already recited, or exposure of the body to radiations from artificial sources of ultraviolet light.

Advice with regard to the best ways to expose infants to sunlight has been furnished in great detail by the United States Children's Bureau. Practical points are these: In spring, fall and summer, under favorable weather conditions, the baby can of course be exposed outdoors. In cold weather, however, it may be necessary to expose him indoors. In the latter event the baby must be placed in the direct rays of the sun (direct shine) with the window open. Care must be used to protect the eyes. This can be accomplished by varying the position, so that the direct rays do not shine into the eyes. A good plan in cold weather is to begin with exposure of the cheeks only and then extend to one extremity at a time. Large areas of the body can be exposed, a part at a time, without danger. Exposure of only a small part of the body for a short space of time is sufficient to produce a general antirachitic effect, if the sunlight happens to be rich in antirachitic rays. In warm weather large surfaces of the body can be exposed with impunity. It is important to remember that sky shine is as valuable as direct shine and at times more valuable and that it is available on cloudy days; also that in winter in the temperate zone only in the noon period are active rays available and at best they are of low intensity.

HOW TO EMPLOY THE ARTIFICIAL SOURCES OF ULTRAVIOLET LIGHT

Treatment with the quartz mercury-vapor lamp may be conducted as follows: The lamp is placed at a distance of 2 or 3 feet from the body, which of course is uncovered, and exposure of the front and back carried out alternately. The exposures are at first for one minute and are increased by one minute at each session until a total of ten minutes is reached. The treatment is carried out every day or every other day. It must be continued for at least a month. At the end of this time periods of exposure may be reduced to from two to three minutes every other day, or some other treatment may be substituted. For the prevention of rickets the irradiations may be carried out every other day and the duration of each session limited to two or three minutes. Treatment with the carbon arc lamp is conducted in a similar manner.

The quartz mercury-vapor lamp is more apt to cause burns than the carbon arc lamp. The burns produced by ultraviolet light are, however, exceedingly superficial (sunburn), and the inflammation disappears in a few days. When either lamp is used, the eyes must be protected. Irradiation with ultraviolet lamps is especially valuable in conditions in which vitamin D cannot be absorbed well from the intestine, e. g. obstruction of the bile duct. It also has been used to advantage in the protection and cure of premature babies. The

41. Miescher, G.: Das Problem des Lichteschultzes und der Lichtgewohnung, Strahlentherapie **35**: 403, 1930.
42. Anderson, W. T., Jr., and Macht, D. I.: Penetration of Ultraviolet Rays into Live Animal Tissue, Am. J. Physiol. **86**: 320 (Sept.) 1928.

quartz mercury-vapor lamp and the carbon arc lamp may be used to supplement administration of vitamin D. When the carbon arc lamps are used, a curative effect may be obtained even though no tanning is produced. The quartz mercury-vapor lamps cause tanning. Tanning is a useful sign that ultraviolet light is producing an antirachitic action. Obviously, the use of the quartz mercury-vapor lamp and of the carbon arc lamp is contraindicated in blonds who "burn" and do not tan. For such individuals it is better to rely on the administration of vitamin D.

THE TREATMENT OF REFRACTORY RICKETS

Refractory rickets is most commonly seen in children over 3 years of age (late rickets), probably because by then the refractory forms have been sifted out. The clinical manifestations, as well as the x-ray, serologic and metabolic, are essentially the same as those in the ordinary infantile form of the disease, although the deformities may be somewhat different. The diagnosis of refractory rickets is arrived at only by trial and failure of vitamin D therapy (or irradiation) in ordinary doses.

Before the conclusion is reached that in a given case the rickets is refractory, it is most important to be certain that the disease is not a peculiar variety of endogenous origin, unrelated to vitamin deficiency, such as that described by a series of investigators (de Toni;[43] Fanconi;[44] Debré, Marie, Cléret and Messimy;[45] Schier and Stern;[46] Ullrich;[47] Schlesinger[48]). The characteristic features of this form of endogenous rickets are glycosuria with a low blood sugar (renal diabetes), acidosis due to the presence of an unidentified organic acid, retardation in physical development (dwarfism) and rickets of an osteoporotic type, which may be extreme and characterized by extremely low inorganic phosphorus values in the serum. Another obscure and at present not clearly described variety of rickets of endogenous origin is earmarked by a disturbance of cystine metabolism and retardation of growth (Lignac;[49] Beumer and Wepler[50]). Finally, the clinician must be certain that the case is not one of renal hyperparathyroidism (renal rickets; renal osteitis fibrosa). Endogenous rickets, such as has been mentioned, and renal hyperparathyroidism are uninfluenced by vitamin D therapy. In fact, in renal hyperparathyroidism vitamin D therapy may be actually dangerous.

After it has been determined that the type of rickets does not fall in the categories just mentioned, vitamin D therapy may be begun. The therapeutic secret seems to lie in the administration of extremely large doses of vitamin D. In the case of a boy of 16 years, reported by Albright, Butler and Bloomberg,[51] it was necessary to increase the dosage of vitamin D to between 1,100,000 and 1,500,000 units daily in order to obtain definite evidence of healing. At the present time it is necessary to give the child 150,000 units daily in order to prevent a recurrence of the disease.[52] In a similar case in a 7 year old child, presently to be reported by Guild and Wilkins, it has been necessary to raise the dosage to 300,000 units daily. In the case reported by Albright, Butler and Bloomberg the first positive indication that the enormous doses of vitamin D were effective was in the calcium-phosphorus metabolism. The calcium-phosphorus balance became positive and the loss of calcium in the stools greatly diminished. This change in excretion occurred without demonstrable change in the level of the inorganic phosphorus of the blood serum. Subsequently, however, the inorganic phosphorus of the blood serum rose slightly. In Guild's case the evidences were active deposition of lime salts at the ends of the growing bones. This was accompanied by a very slight increase in the level of the inorganic phosphorus in the serum. The important point is that in these refractory cases, as nearly as one can judge from two instances, the effect of the very large doses of vitamin D on the level of the inorganic phosphorus in the blood serum was very slight. In both the cases mentioned, the difficulty did not lie in the absorption of vitamin D. In Guild and Wilkins' case measurements of the vitamin D in the blood serum showed that it was present in 200 times the level regarded by Warkany[53] as being normal.

The cure of rickets experimentally produced in the rat by means of citric acid-sodium citrate solution has been described by Hamilton and Dewar[54] and Shohl[55] and recently a curative action in the case of two infants has been reported by Shohl and Butler.[55a]

The mode of action of the citric acid-sodium citrate combination in rickets is not known. The hypothesis which led to the trial of the citric acid treatment was that an alkaline effect in the intestine and an acid effect in the body would favor the development of rickets, whereas an acid reaction in the alimentary tract and an alkaline effect in the body would oppose its development. The citric acid-sodium citrate solution theoretically would tend toward the production of an acid state in the alimentary tract and an alkaline one in the body. A tartaric acid and sodium bitartrate solution was discovered by Hamilton and Dewar to be effective. However, Shohl found that malic, malonic and succinic acids were not effective. A possible factor in the "citrate effect" may lie in a peculiarity of the compound which calcium forms with citric acid. "Shear and Kramer and Shear, Kramer and Resnikoff showed that a solution of sodium citrate, added to a solution containing calcium ions, removes the calcium ions from the solution and that the calcium ions are bound by the citrate ions in some kind of soluble slightly ionized complex, the exact nature of which is unknown" (Hamilton and Dewar). A further peculiarity lies in the fact that healing takes place under the influence of the citric acid-sodium citrate treatment at calcium and phosphorus levels in the blood below those considered essential for

43. de Toni, G.: Remarks on the Relations Between Renal Rickets (Renal Dwarfism) and Renal Diabetes, Acta paediat. **16:** 479, 1933.

44. Fanconi, G.: Der frühinfantile nephrotisch-glykosurische Zwergwuchs mit hypophosphatämischer Rachitis, Jahrb. f. Kinderh. **147:** 299, 1936.

45. Debré, Robert; Marie, Julien; Cléret, F., and Messimy, R.: Rachitisme tardif coexistant avec une néphrite chronique et une glycosurie, Arch. de méd. d. enf. **37:** 597 (Oct.) 1934.

46. Schier, A., and Stern, A.: Ueber einen Fall von unheilbarer Rachitis, Arch. f. Kinderh. **78:** 176 (June) 1926.

47. Ullrich, O.: Ueber neuere Behandlungsverfahren der englischen Krankheit im Dienste der allgemeinen Rachitisbekämpfung: Versager der Rachitistherapie und Tier-rachitis, München. med. Wchnschr. **76:** 1433 (Aug. 23) 1929.

48. Schlesinger, Bernard: Renal Dwarfism and Rickets, Proc. Roy. Soc. Med. **25:** 10 (Nov.) 1931.

49. Lignac, G. O. E.: Ueber Störung des Cystinstoffwechsels bei Kindern, Deutsches Arch. f. klin. Med. **145:** 139 (Oct.) 1924.

50. Beumer, H., and Wepler, W.: Ueber die Cystinkrankheit der ersten Lebenszeit, Klin. Wchnschr. **16:** 8 (Jan. 2) 1937.

51. Albright, Fuller; Butler, A. M., and Bloomberg, Esther: Rickets Resistant to Vitamin D Therapy, Am. J. Dis. Child. **54:** 529 (Sept.) 1937.

52. Albright, Fuller: Personal communication to the author.

53. Warkany, J.: Estimation of Vitamin D in Blood Serum, Am. J. Dis. Child. **52:** 831 (Oct.) 1936.

54. Hamilton, Bengt, and Dewar, Margaret M.: Effect of Citrate and Tartrate on Experimental Rickets, Am. J. Dis. Child. **54:** 548 (Sept.) 1937.

55. Shohl, A. T.: Effect of Acid-Base Content of Diet upon Production and Cure of Rickets with Special Reference to Citrates, J. Nutrition **14:** 69 (July) 1937.

55a. Shohl, A. T., and Butler, A. M.: New England J. Med. **220:** 515 (March 23) 1939.

the deposition of lime salts in bone. For example, Shohl and Butler discovered lime salt deposition occurring in the bones of one of their rachitic children when the serum calcium concentration was 8.7 and the inorganic phosphorus concentration 3.1 mg. per hundred cubic centimeters. In their other case, healing was noted when the serum calcium was 6.3 and the inorganic phosphorus 3.8 mg. per hundred cubic centimeters. Under the influence of the therapy the serum calcium falls and the inorganic phosphorus rises slightly. The same phenomenon has been noted in the rat. Healing was observed as early as from six to nine days after the treatment was commenced and perhaps actually occurred earlier. With the low calcium value concentration tetany was not produced.

Shohl and Butler used 20 cc. molar citric acid and 30 cc. molar sodium citrate. This was added to the formula as a diluent. They are inclined to think, however, that citric acid in excess of the sodium citrate would have been preferable and suggest two parts molar acid to one part molar salt.

Chaney and Blunt [55b] reported fifteen years ago that orange juice, from 600 to 700 cc. daily, increases the calcium, phosphorus retention and, to a lesser extent, the magnesium retention in the human being. Orange juice can cure rickets, as attested by personal experience. But the curative effect will disappear as soon as the orange juice therapy is stopped. The amount of the citrate used by Shohl and Butler in the treatment of their two infants suffering from rickets was equivalent to that furnished by "five to six large oranges."

We do not recommend the citric acid-sodium citrate treatment of rickets as a substitute for the vitamin D treatment but only as a method to be employed under special circumstances, perhaps in conjunction with vitamin D treatment. Albright and Sulkowitch [55c] reported beneficial results from the administration of the citrate mixture in a patient with nephrocalcinosis. Unfortunately, the citric acid-sodium citrate treatment has been found to be useless in cases of rickets refractory to vitamin D treatment.[55d]

Successful treatment by means of the administration of alkali in certain unusual cases not understood has been reported (Boyd;[56] Bornscheuer;[57] Stearns and Warweg [58]).

Finally, attention is called to the fact that in obstructive jaundice vitamin D is not absorbed well from the alimentary tract. Under conditions in which the flow of bile into the intestine does not take place, it is advisable to treat rickets by means of ultraviolet light.

HOW TO INDUCE RAPID HEALING

In so-called thoracic rickets, described by Park and Howland,[59] the weakness of the thorax is a menace to the life of the child. In such cases it is advisable to supply rigidity with the least possible loss of time. In the case of a baby aged 8 months suffering from very advanced rickets, one can give daily doses of 50,000 units of vitamin D. When the healing begins, as can be detected by means of x-ray films or calcium and inorganic phosphorus determinations, the dosage should be reduced to the ordinary curative levels. Several investigators (Harnapp;[60] Bischoff;[61] Schirmer [62]) have tried the use of enormous single doses of vitamin D, e. g. 600,000 units, and have reported that no bad effects result. It has been shown recently that after a single large dose of vitamin D the vitamin remains in the body for a number of weeks.[63] I do not recommend the single dose method. To the infant as much as 50,000 units of vitamin D can be given daily with safety for two or three weeks. If the dose is continued longer, one must watch for toxic effects.

HOW TO DETERMINE THAT VITAMIN D THERAPY IS SUCCEEDING

The best way to determine whether vitamin D is succeeding is by measurements of the calcium and inorganic phosphorus in the blood serum or x-ray examination or preferably both. If the level of the calcium is normal and the inorganic phosphorus rises to 5 mg. per hundred cubic centimeters or above, one knows that a curative effect has been obtained. In cases of ordinary rickets, treated with the usual doses of vitamin D, a rise in the inorganic phosphorus level of the blood serum can be expected on about the tenth day. If very large doses of vitamin D are given, the rise in the level of inorganic phosphorus of the blood serum may occur as early as the fifth or sixth day after the beginning of treatment. Under ordinary conditions the first evidence of deposition of lime salts at the ends of the long bones occurs about the twenty-first day. But if very large doses of the vitamin are given, signs of deposition may be found on the tenth day. When enormous doses of vitamin D have been given, doses in the hundred thousands of units, the signs of deposition in the x-ray films have been reported on the fifth or sixth day. If the physician is obliged to rely on inspection and palpation in order to gage the effect of antirachitic treatment, it is very difficult to be certain that the cure has begun. The recession of the deformities is a very gradual process. Perhaps the most obvious clinical indication that the treatment is successful, but one that is hard to appraise, is improvement in muscle function. The child begins to make efforts to walk or to sit up. He seems stronger or more active. Very gradually the deformities of the cartilage-shaft junctions vanish and the bones seem to have acquired an increased degree of rigidity.

If the x-ray appearance is used as a guide to the effectiveness of treatment, it is important to remember that the filling in process of the ends of the bones in extreme rickets requires from two to three months and that the pattern of the lesion will remain visible in the roentgenogram for months after the disease has been completely arrested.

SIGNS OF TOXICITY OF VITAMIN D

One need not fear that the dosage of vitamin D will be toxic unless renal insufficiency exists or unless the dosage is extremely large. To adults, enormous doses

55b. Chaney, M. S., and Blunt, K.: J. Biol. Chem. **66:** 829-846 (Dec.) 1925.

55c. Albright, Fuller; Consolazio, W. V.; Coombs, F. S.; Sulkowitch, H. W., and Talbott, J. H.: Bull. Johns Hopkins Hosp. **66:** 7-33 (Jan.) 1940.

55d. Shohl: Personal communication to the author.

56. Boyd, J. D.: Endogenous Rickets, Proc. Soc. Exper. Biol. & Med. **28:** 181 (Dec.) 1928.

57. Bornscheuer, P.: Ein Fall von endogener gegen D-Vitamin und Licht resistenter perennierender Rachitis, Ztschr. f. Kinderh. **51:** 56, 1931.

58. Stearns, Genevieve, and Warweg, Edna: Studies of Phosphorus of Blood, Phosphorus Partition in Whole Blood and in Serum and Serum Calcium and Plasma Phosphatase During Healing of Late Rickets, Am. J. Dis. Child. **49:** 79 (Jan.) 1935.

59. Park, E. A., and Howland, J.: The Dangers to Life of Severe Involvement of the Thorax in Rickets, Bull. Johns Hopkins Hosp. **32:** 101 (April) 1921.

60. Harnapp, G. O.: Rachitisbehandlung durch einmalige Verabfolgung von vitamin D_2, Monatschr. f. Kinderh. **66:** 318, 1936.

61. Bischoff, H.: Rachitisbehandlung mit konzentrierten Vigantol, Jahrb. f. Kinderh. **150:** 2, 1937.

62. Schirmer, R.: Rachitisbehandlung mit einmaliger Vitamingabe, Monatschr. f. Kinderh. **68:** 269, 1937.

63. Heymann, Walter: Metabolism and Mode of Action of Vitamin D: II. Storage of Vitamin D in Different Tissues in Vivo, J. Biol. Chem. **118:** 371 (April) 1937.

of vitamin D have been given over long periods without apparent injury. The symptoms of overdosage seem to be nausea, headache, diarrhea, loss of appetite, frequent micturition and nocturia and lassitude.[64] In the case of the ordinary full term baby more than 3 months of age I regard 50,000 units as lying in the danger zone if given for more than two weeks. For small premature babies I believe that signs of overdosage ought to be watched for if more than 20,000 units is given daily for more than two weeks. Reed [65] assures me that the toxic effects of vitamin D are independent of its action in raising the calcium and inorganic phosphorus concentration in the blood serum. However, in treating rickets with correction of the disturbance of the calcium and phosphorus metabolism as the main objective, the elevation of calcium above 12 mg. per hundred cubic centimeters is an indication that the dosage has been exceeded and ought to be reduced. With a rise in the serum calcium, a rise in inorganic phosphorus takes place. But this may not reach even the normal level. If the excessive vitamin D therapy is continued, undoubtedly the inorganic phosphorus, as well as the calcium, will become much elevated, and metastatic calcification will occur. In rickets great aid is furnished by the x-ray examination alone. If the x-ray film reveals shadows which indicate healing, the inference can be made that the vitamin has begun to act and that the desired effect of treatment has been gained.

Examination of the urine may reveal evidence of overdosage. Albright and his collaborators [51] noted in their case of intractable rickets under treatment with enormous doses of vitamin D that the urine was loaded with calcium and contained many calcium casts such as have been observed in cases of hyperparathyroidism [66] and were able to infer from the presence of the calcium and the characteristic casts in the urine that the dosage of vitamin D had reached toxic proportions.

THE RELATIVE COST OF THE DIFFERENT PREPARATIONS OF VITAMIN D

Of the preparations of vitamin D in oil, cod liver oil is still the most economical. In terms of international units, some of the more expensive brands of cod liver oil are more economical than some of the cheaper brands. For example, oil selling at 50 cents a pint and having only the required 85 units per gram costs twice as much per 1,500 units as a very high grade of oil, sold at 90 cents a pint but containing 350 units per gram. The oils depending for their enrichment on viosterol cost in general twice as much as the concentrated fish oils. The fish oils highly concentrated in vitamin D are as economical sources as many of the poorer brands of cod liver oil. Irradiated milk is about one third as economical as metabolized or reinforced milk. In each case the enrichment process adds about 1 cent per quart, so that the vitamin D milks are considerably more expensive in terms of units than is cod liver oil or the concentrated fish oils. No extra charge is made for vitamin D in canned evaporated milk. The amount of the vitamin in the milk, however, is very low, being only 135 units per reconstituted quart.

It is my inclination to prefer cod liver oil or the concentrated fish oils to the viosterol preparations for the reason that it seems better to prescribe a preparation of vitamin D which is also rich in vitamin A than one which contains vitamin D alone.

The quartz mercury vapor lamps and the carbon arc lamps are expensive sources of vitamin D in comparison with cod liver oil. The quartz mercury vapor lamp costs more initially but is said to be less expensive to operate. However, these lamps are not necessarily expensive sources if large groups of children can be treated simultaneously, as is possible in institutions. The carbon arc lamps are the ones best suited for the purpose just mentioned.

Johns Hopkins Hospital.

64. Rappaport, B. Z., and Reed, C. I.: Viosterol of High Potency in Seasonal Hay Fever and Related Conditions, J. A. M. A. **101:** 105 (July 8) 1933. Dreyer, Irving, and Reed, C. I.: The Treatment of Arthritis with Massive Doses of Vitamin D, Arch. Phys. Therapy **16:** 537 (Sept.) 1935. Wyatt, B. L.; Hicks, R. A., and Thompson, H. E.: Massive Doses of Vitamin D in the Treatment of Proliferative Arthritis, Ann. Int. Med. **10:** 534 (Oct.) 1936. Livingston, S. K.: Vitamin D and Fever Therapy in Chronic Arthritis, Arch. Phys. Therapy **17:** 704 (Nov.) 1936. Vrtiak, E. G., and Lang, R. S.: Observations on the Treatment of Chronic Arthritis with Vitamin D, J. A. M. A. **106:** 1162 (April 4) 1936. Farley, R. T.: Management of Arthritis, Illinois M. J. **71:** 74 (Jan.) 1937. Krafka, Joseph, Jr.: Simple Treatment for Psoriasis, J. Lab. & Clin. Med. **21:** 1147 (Aug.) 1936. Ceder, E. T., and Zon, Leo: Treatment of Psoriasis with Massive Doses of Crystalline Vitamin D and Irradiated Ergosterol: A Preliminary Report, Pub. Health Rep. **52:** 1580 (Nov. 5) 1937.

65. Reed: Personal communication to the author.

66. Albright, Fuller, and Bloomberg, Esther: Hyperparathyroidism and Renal Disease, with a Note as to the Formation of Calcium Casts in This Disease, Tr. Am. A. Genito-Urin. Surgeons **27:** 195, 1934.

CONFERENCES ON THERAPY

TREATMENT OF BLOOD DISORDERS

X. EFFECTS PRODUCED BY DRUGS

NOTE.—*These are actual reports, slightly edited, of conferences by the members of the Departments of Pharmacology and of Medicine of Cornell University Medical College and the New York Hospital, with the collaboration of other departments and institutions. The questions and discussions involve participation by members of the staff of the college and hospital, students and visitors.*

DR. HARRY GOLD: In the series of conferences on the blood diseases that we have had in recent weeks, references have been made from time to time to the actions of drugs on the blood, more particularly in relation to their use as therapeutic agents. Here is a list of the more important ones:

1. Iron.
2. Copper.
3. Arsenic.
4. Benzene.
5. Phenylhydrazine.
6. Certain more complex organic materials (used in the treatment of pernicious anemia).

The list of agents that are useful in the treatment of blood diseases is small. Today we will consider in greater detail the effects of chemical agents on the blood and hemopoietic organs in persons without blood diseases.

This subject is encountered in practice in three general situations:

First, it presents problems in differential diagnosis. Stimulation of the vagus nerve produces eosinophilia. The parasympathetic drugs produce eosinophilia. A dose of pilocarpine, muscarine or barium can nearly double the white cell count in the circulating blood owing presumably to constriction of the smooth muscle of the spleen. A dose of epinephrine can cause a fairly pronounced increase of the red cell count. These do not directly act on the blood, but they certainly change the normal blood picture and are sources of confusion. Epinephrine causes hemoconcentration by its action in constricting the hepatic veins, as a result of which plasma passes out of the circulation and the red cell count goes up. Prolonged surgical anesthesia

with ether causes fairly pronounced leukocytosis. These matters are not given consideration very often because they really are not of serious consequence, but as I have said they can be a source of confusion. Autonomic effects and disturbances in the central nervous system cause diversified changes in the blood picture.

Second, the problem of the actions of drugs on the blood is encountered in connection with industrial poisoning.

Third, blood changes are encountered as side actions or toxic actions in the course of the use of drugs for therapeutic purposes.

How to manage these disturbances of the blood when they are due to a known agent would seem on the surface to be perfectly simple. The first answer that comes to mind is this: Discontinue the drug. That is all right in industrial poisoning, but in cases in which toxic effects arise in the course of the therapeutic uses of such a compound as sulfanilamide that answer falls short. If one cannot safely discontinue the drug, the question arises: How far can one go without producing irreparable damage? Some of these points may be cleared up in the course of the discussion today.

Once the point of view is shifted from agents used in the treatment of blood diseases to agents which affect the blood and the hemopoietic organs, the numbers that need to be considered mount steeply from the five or six that I have mentioned to literally hundreds and perhaps thousands of chemical agents.

There is hardly a major class of chemical agents that does not contribute members that disturb the blood and blood forming organs:

1. Alkaloids.
2. Glucosides.
3. The aliphatic hydrocarbons and their derivatives.
4. Benzene and its derivatives.
5. Metals.
6. Other chemicals.

The more important sites of their actions in disturbing the blood picture are:

1. The smooth muscle of organs in which the blood is stored, especially the spleen, or the smooth muscle of the hepatic vessels.
2. The bone marrow.
3. The elements in the circulating blood itself.

What kind of disturbances in the blood elements do drugs produce? I have here a list of changes that are encountered as the result of known compounds:

Erythropenia.
Erythrocytosis (polycythemia).
Hemolytic anemia.
Color index (may be high or low).
Reduction of blood platelets.
Purpura haemorrhagica.
Leukocytosis.
Lymphocytosis.
Eosinophilia.
Leukopenia.
Granulocytopenia.
Agranulocytosis.
Myeloid leukemia.
Combinations of the foregoing conditions.

That list is not complete, but I think it gives some idea of how widely diversified the changes are which chemical agents can produce in the blood.

In the bone marrow are also encountered the most diversified types of changes by drugs, from complete aplasia of all the elements at one extreme to the hyperplasia characteristic of pernicious anemia at the other; and between these all sorts of more or less specific pictures have been described.

There are also changes in the coagulation of the blood, which may be increased or decreased. Chloroform can produce an almost complete disappearance of the coagulability of the blood. A dose of epinephrine can increase the coagulability of the blood from 200 to 300 per cent. The significance of such effects on the blood is in certain situations very considerable.

Also there are changes in the hemoglobin, more commonly the production of methemoglobin and sulfhemoglobin.

Pharmacologists can take little pride or satisfaction in the state of our knowledge of the blood disturbances caused by drugs. The attack on these problems has not been at all systematic. There is, as a result, almost no knowledge as to how many of the more important chemical agents produce their effects on the blood and hemopoietic system, with but few exceptions. In a story that is so fragmentary, there is always a temptation to try to make some order by filling in the clinical gaps with the results of animal experiments. There great danger lies because there are such wide species differences in the response of the blood to chemical agents. Of course, species differences in response to drugs are not confined to the blood.

Just a few illustrations: A large dose of potassium chlorate produces methemoglobinemia readily in man, the dog and the cat, but the rabbit seems immune. Benzene poisoning in the animal is characterized predominantly by leukotoxic action; the destruction of red cells is more or less at a minimum. In man, on the other hand, chronic benzene poisoning is very often associated with severe grades of anemia. We have to be very cautious, in view of these facts, when we try to complete the story of mechanisms that operate in man, from the results of animal experiments, although animal experiments undoubtedly throw a considerable amount of light on some of these problems.

Benzene and compounds derived from it are among the most frequent causes of serious disturbances of the blood. All compounds containing the benzene nucleus are now considered potential sources of injury to blood and bone marrow. The site of benzene action appears to be more especially the bone marrow, although action on the circulating elements is apparently also present. In the bone marrow benzene compounds cause structural and functional disturbances of the elements concerned with the formation of the red cells, the white cells and thrombocytes. In the extreme grades of chronic poisoning there is a typical picture of aplastic anemia.

There are conditions, however, under which these substances are much more selective in their action, giving rise, for example, to fairly typical cases of purpura haemorrhagica, in which only the thrombocytic element of the bone marrow is injured; or agranulocytosis, in which specific action on the white cell marrow is produced; or fairly typical pictures of hemolytic anemia, in which the white cells are influenced little if at all. Those are the more infrequent types; nevertheless such selectivity is encountered.

Although the mother substance, benzene, seems to be capable of most of the essential actions on the blood and the blood forming organs, derivatives tend to shift the pattern of actions, bringing out some and suppressing others. Many such examples are found in pharma-

cologic literature, and this phenomenon also is not confined to the pharmacology of the blood. The more important compounds are:

1. Phenylhydrazine and compounds derived from it, antipyrine and aminopyrine.
2. Sulfanilamide.
3. Aniline and its derivatives acetanilid and acetophenetidin.

Phenylhydrazine produces its most striking effect on the red cells, causing hemolysis. A derivative of phenylhydrazine, antipyrine, and another one, aminopyrine, hardly influence the red cells at all but act predominantly on the white cell structures of the bone marrow. Sulfanilamide seems to stand somewhere between those two. It produces hemolytic anemia, a hemolytic action on the red cells, and also agranulocytosis, which appears to be a more or less specific type of action on the myeloblasts, interfering with their maturation. Acetanilid and acetophenetidin hardly influence the bone marrow at all. Their action is exerted chiefly on the hemoglobin. These compounds may give rise to cyanosis resulting from methemoglobinemia and sulfhemoglobinemia.

A review of some of the experimental and clinical literature on poisonings by benzene as well as some of its derivatives, aminopyrine and sulfanilamide, makes possible a certain number of general statements concerning their behavior:

First, individual differences in susceptibility to these compounds are observed. Only rare individuals of a large group that are exposed appear to contract the blood disorder. Perhaps we may discuss the causes of these differences. Do they represent anything fundamentally different from the individual differences in susceptibility that are seen, for example, in connection with morphine, epinephrine or any other drug?

The allergic hypothesis has been introduced into this story. It has been advanced as a mechanism of the action of these compounds. A doctor in whose hands a patient has been poisoned with one of these compounds heaves a sigh of relief when the magic word "allergy" or "idiosyncrasy" is uttered. It seems to free one of responsibility for overdosage. I was particularly struck by a report in which a baby 1 year old received daily doses of 1 Gm. of sulfanilamide for many days. Hemolytic anemia developed. It was ascribed to idiosyncrasy to sulfanilamide. The dose represents the equivalent of about 7 Gm. of sulfanilamide daily to adults, a large dose. Many of the cases appear to represent poisoning by the direct toxic action of the drug rather than to involve any qualitatively peculiar state because the doses of the drug supply a source of benzene equal to the doses of benzene intended for the suppression of bone marrow, as in the treatment of leukemia.

In the course of poisoning, particularly if it involves the bone marrow, as Kracke has pointed out in connection with agranulocytosis, there are three more or less distinct phases. In the more fulminating type these phases are not so distinct, but in the more chronic type they are the bone marrow phase, the blood phase and the clinical phase or the symptom phase. It simply means that there may be a great deal going on in the bone marrow long before one begins to detect changes in the circulating blood. Animal experiments which Dr. Climenko made in this laboratory some years ago have a bearing on this. He gave large doses of cyclic compounds and produced marked changes in the marrow of rabbits while the circulating blood remained normal.

Prolonged exposure to a given concentration of these compounds seems to produce effects which are not seen after short exposure. That is unusual, as drugs go. If one exposes a patient for a long time to a given concentration of quinidine or digitalis, whatever effect has been obtained with that concentration at the beginning continues, but in the case of these compounds the same concentration continued over a long time seems to do something to the bone marrow which is not due to the fact that more drug is accumulating. Specifically, if no toxic effects seem to occur with 5 mg. of sulfanilamide per hundred cubic centimeters of blood in five or six days, does that fact preclude injury if that concentration is continued for thirty or forty days?

When the compounds of the benzene group are discontinued after having been taken for some time, the effects may continue, and several days or even weeks later the manifestations of poisoning may appear.

DISCUSSION OF QUESTIONS

STUDENT: Dr. Gold has suggested that the use of acetanilid and acetophenetidin results in methemoglobinemia and sulfhemoglobinemia. Where is the sulfur derived from for the production of sulfhemoglobinemia?

DR. GOLD: These drugs do not produce methemoglobinemia or sulfhemoglobinemia directly. The evidence at present seems to indicate that in some way they sensitize the hemoglobin to the action of reducing agents or to sulfur compounds. If a large dose of hydrogen sulfide is given to a dog it fails to produce sulfhemoglobinemia, but if that dog has been treated with acetophenetidin daily for several days then the same treatment with hydrogen sulfide will result in sulfhemoglobinemia, although the acetophenetidin itself did not produce it. An interesting contribution to this subject has been made by Snapper in Holland and by Harrop and Waterfield in this country. In regard to methemoglobinemia the view is that reducing substances like nitrites absorbed from the gastrointestinal tract reduce to methemoglobin the hemoglobin "sensitized" by aniline derivatives. These compounds may exert some sort of catalytic action by which the change is brought about.

DR. CARL SMITH: Our dose of sulfanilamide for children is 0.2 Gm. per kilogram, and for a baby weighing about 12 Kg. the dose would be 2.4 Gm. a day. This has proved quite safe in our hands, although a smaller dose daily caused hemolytic anemia in the reported case that Dr. Gold mentioned.

DR. MCKEEN CATTELL: It has been reported that relatively larger doses of sulfanilamide must be administered to children in order to obtain a given blood concentration.

DR. WALTER MODELL: Dr. Gold raised the question of the increasing effect of benzene compounds when a fixed dose is given over a long period of time. It has been found in studies on the prevention of relapses in rheumatic fever in children employing about 2 to 5 Gm. of sulfanilamide a day over many months that if there is no evidence of an effect on the bone marrow in a short time the drug can be continued for many months without showing this effect.

DR. CATTELL: It would be desirable to have further discussion on the problem which Dr. Gold raised regarding possible idiosyncrasy to these drugs. Dr. Rhoads has carried on experimental studies on the effects of vitamin deficiencies in relation to susceptibility, and I wonder if he would tell us something about them.

DR. CORNELIUS P. RHOADS: Our observations are still incomplete and wholly inconclusive. We felt that we had clear evidence from animal experiments that in the presence of inadequate diets the effect of aminopyrine on the bone marrow was more pronounced than when adequate diets were fed.

We have been very much interested in the effect of dietary constituents on the conversion of a variety of cyclic hydrocarbons. In the monkey, for example, dibenzanthracene produces not a malignant tumor at the site of injection but a condition similar to aplastic anemia in man. Experiments are in progress to ascertain how this effect can be altered, but we have no conclusive evidence at the present time. I am sure that there is no valid proof at the moment for the participation of dietary constituents in the conversion and supposed detoxification of any of the compounds discussed this morning. It is possible that something of that sort may develop. I think you all know of the observation of Dr. Levine and his co-workers, who have recently shown an improper metabolism of the cyclic amino acids in the presence of vitamin C deficiency. We had already noted a similar occurrence in certain patients with hepatic disease, but we had not ascertained the vitamin C effect.

There is a long story concerning the effect of dietary constituents on susceptibility to the compounds used in the munitions works in the great war. The observation was made, and a very poor and inadequate observation it was, that the effect on hemopoiesis of exposure to trinitrotoluene was most marked in persons who took inadequate diets. There were made at that time certain experiments on rabbits using naphthalene as a toxic cyclic compound. It was shown that the toxic effect could be inhibited by giving adequate diets and was more marked when inadequate diets were fed. That observation led to the work of Bourne, who showed that naphthalene cataract could be prevented by feeding diets high in cysteine, and to a series of experiments concerning the participation of cysteine in the detoxification of various cyclic compounds.

Goerner observed that the toxic effect of dibenzanthracene was much more marked when the animals were on a deficient diet, and that observation we have confirmed. Furthermore, we have some evidence, but wholly inconclusive, that the conversion of dibenzanthracene into dihydroxydibenzanthracene is conditioned to some extent by something in the diet.

I regret that I have to be so indefinite, but I have been at this for a good many years, and still we don't have accurate methods; hence absolute proof is not at hand.

DR. CATTELL: Would you say something about those indole experiments in anemias?

DR. RHOADS: If dogs are fed a normal diet with a high content of meat and given about a gram of indole a day the drug is tolerated without considerable anemia, though the animals vary in their susceptibility, and some increase in the output of bile pigment can be demonstrated as evidence of blood destruction. The rate of blood destruction caused by the indole given with a normal diet is not sufficient to produce anemia of any considerable degree, and what little is produced is compensated for by increase of active marrow. If the animals are starved or fed a diet lacking something contained in yeast or liver and then given indole, a pronounced anemia is produced very rapidly with or without marked increase in numbers of reticulocytes. If the diet is made normal once more, the blood levels will rise rapidly, though they will not always come back to normal. It seems to us that by lack of a dietary constituent—and we have never identified it, there may be more than one—the susceptibility of the animal to the hemolysis by indole was increased, and that susceptibility could be overcome by making the diet normal.

Those experiments were checked in a second series with sterile biliary fistulas so that the excretion of bile pigment could be measured. The results were corroborative; that is, the hemolysis was active while the diet was bad and less active when the diet was good.

DR. DAVID R. CLIMENKO: I think one of the things you should bring in is the possible mode of action, Dr. Rhoads, and speak of your in vitro work on the hemolytic action of indole as against indican.

DR. RHOADS: That work was done by Dr. Ponder in collaboration with us. Dr. Ponder showed that indole in vitro in sufficient concentrations is lytic to normal red cells, and that the normal conversion product of indole, indican, is not lytic. That observation is easily reproduced, and I think there is no question about it. We inferred of course that the conversion of indole to indican in our dogs was interfered with in the presence of the poor diet, but we have not been able to prove that. We could not demonstrate any difference in the blood levels of indole or indican in animals on good or poor diets, so I am not at all sure that this matter of conversion of hydrocarbons is at all settled. It is a terribly difficult one. We have studied the glycuronide and sulfate mechanisms in patients and we are now studying the hydroxylation, but we still have no conclusive experiments. It is worth while to mention the studies on butter yellow although they do not bear on the blood dyscrasies. Several Japanese workers administered alpha-amino-azotoluene and also amino-azobenzene to animals. Both of these agents are destructive to liver tissue, and liver cancer will result. The effect will occur, however, only if the animals are fed an inadequate diet, and the animal is entirely protected if the diet is adequate. We do not know the constitution of the dietary substance, but the fact is clear that the destructive effect of these two compounds is seen only when the diet is inadequate and is never seen if the diet is made adequate. I think that is in some sense a confirmatory thesis, that there may be a detoxification mechanism controlled by some constituent of the diet.

HEMOLYTIC ACTION OF SULFANILAMIDE

DR. CATTELL: Are there questions for Dr. Rhoads? If not, perhaps Dr. Climenko would make a few remarks on the hemolytic action of sulfanilamide.

DR. CLIMENKO: I should like to bring out one point regarding the possible mode of action of sulfanilamide as an etiologic agent in the production of hemolytic anemia. If one makes a normal time kinetic curve for the action of lysin on normal red cells, one gets a fairly definite curve and finds a definite relation between time required for total lysis and concentration of lysin. If one adds to such a system a quantity of sulfanilamide such as is ordinarily present in the blood in therapeutic ranges, approximately 10 mg. per hundred cubic centimeters, the curve will be altered in this manner: the action of the lysin on these cells will be accelerated. The cells are less resistant to the lytic agent than they were before the addition of sulfanilamide. It should be pointed out that aniline, for example, possesses the same accelerating effect to a more marked degree.

In the body, aniline goes through this probable mechanism: It is converted from aniline to phenylhydroxylamine and from phenylhydroxylamine to paraaminophenol. A large portion of it is excreted in the form of a conjugated ethereal sulfate. It has been shown that following the administration of aniline or benzene there is an increased output of ethereal sulfates in the urine.

We have found that this holds true in the case of sulfanilamide. The ratio of ethereal sulfates to inorganic sulfates present in the urine after the administration of sulfanilamide will be increased. Most of the sulfanilamide that is administered can be recovered either as sulfanilamide or as acetyl derivative. A small proportion of it—less than 5 per cent—cannot be accounted for. From our indirect evidence on the increased output of ethereal sulfate after the administration of sulfanilamide, it may be suggested that a small proportion of the drug goes through this oxidation mechanism, and, as it may occur to a greater extent in certain individuals than in other individuals, it may be suggested as a possible explanation for the occurrence of the blood dyscrasies which arise in the so-called "susceptible" individual.

DR. GOLD: As to the increase in susceptibility of the cells to lysis, is it also true about cells taken from the blood after sulfanilamide has been given?

DR. CLIMENKO: Unfortunately the reverse is true. There is an increase in the resistance of the cells to the lytic agent. This occurs some days after the administration of sublethal doses of benzene or aniline. The explanation may be that the less resistant cells have already disappeared as a result of an acceleration of the normal lytic mechanism in the body, and that the in vitro hemolytic system is made up only of the more resistant cells which are still present in the circulation.

DR. GOLD: Here is an interesting point. It comes up in connection with many drugs which destroy the blood cells: Alcohol, which causes some lysis of blood cells after prolonged administration, will also leave the blood more resistant to lytic agents, and a similar resistance develops after phenylhydrazine. After it has lowered the red cell count, a degree of resistance to further lowering is noted. The cause of this resistance is probably the fact that the population of red cells which survives is a hardier population.

DR. CLIMENKO: I think that is probably the explanation.

EFFECT OF METALS

DR. CATTELL: Dr. Reznikoff will discuss the effect of metals, especially lead.

DR. PAUL REZNIKOFF: I may first say a few words about gold salts. These depress any or all of the constituents of the bone marrow. Another characteristic of gold which I should like to emphasize is that it is stored and its effects may be present a long time after the gold is administered. We had a nurse who was given gold therapy for lupus five years before she injured her foot. She had an infection following the injury, and after this mild infection there developed an aplastic bone marrow involving all of the elements. I bring that up because gold is used in the therapy of lupus and is now also being used for arthritis. So let us watch out for gold salts.

I wish to speak briefly about the action of lead on the red blood cells. In vitro, lead salts cause the erythrocytes to shrink and become rigid so that they cannot swell and shrink as readily as normal cells. They become brittle and more fragile to trauma. These "leaded" cells tend to clump and their specific gravity increases. If normal red blood cells are placed in modified Ringer's solution the salt content of which varies from 0.5 to 1.3 per cent, the specific gravity of the cells varies from 1.060 to 1.110. Under the same conditions "leaded" erythrocytes seem heavier, the range being from 1.082 to 1.111. The behavior of leaded red blood cells in hypotonic saline solution (fragility test) is also interesting. In the more dilute solutions (from 0.15 to 0.3 per cent) these cells hemolyze less readily, probably because they are more rigid. However, in the zones from 0.4 to 0.5 per cent they tend to break up more readily. This phenomenon can be duplicated in vivo if 1 Gm. of a lead salt is given to a rabbit by mouth and its blood is tested.

Lead salts cause anemia by hemolysis. The affected cells cannot withstand the trauma of circulation and the swelling and shrinking when changing from the venous to the arterial systems as readily as normal erythrocytes. The so-called stippled cells are really reticulocytes the reticulum of which has become discrete or punctate. These are increased in number because of the reaction of the bone marrow to hemolysis. A reticulocyte count, in my opinion, is a much more delicate index of the action of lead on the red blood cells in the circulation than the count of the stippled cells.

The anemia of lead poisoning usually takes care of itself if the lead is removed from the circulation. Neither iron nor liver extract is indicated. In the severe anemias transfusions are the only means of bringing the blood count to a normal level, just as in any other hemolytic anemia.

There are two schools of thought concerning the treatment of lead poisoning after the acute symptoms have subsided. One group tries to delead the patient by putting him on a low calcium diet (0.2 Gm. a day) and administering ammonium chloride in about 4 Gm. doses daily for a few days. This produces an acidosis and the patient excretes more lead. Another method, and I follow this plan with my patients, is to store the lead in the bones by giving a high calcium intake and vitamin D. As long as lead is removed from the circulation and stored in the bones, it is harmless. Of course, the symptoms and signs of lead poisoning, such as colic, palsy and encephalopathy, have to be treated individually. For the details of the therapy of lead poisoning, I refer you to chapter 15 in a book which has just been published by the Oxford University Press entitled "Industrial Hygiene," edited by Lanza and Goldberg.

TREATMENT OF DRUG DISORDERS

DR. CATTELL: Dr. Forkner, will you describe the management of patients who show evidence of disorders of the blood due to a drug?

DR. CLAUDE S. FORKNER: Frequently patients will not be aware that they have taken any harmful drugs. This information must be obtained by careful detective work. At times remaining samples of the drug can be supplied by the patient or a prescription can be traced. The effects of drugs harmful to the blood forming organs are not infrequently delayed for several days, several weeks or even months. The most important point in treatment is to discontinue any medication which may be suspected as the offending agent. Thereafter symptomatic treatment is indicated, with careful attention to the behavior of the number and quality of the structural elements of the blood. If severe bleeding, the result of thrombocytopenia, is present, frequent

transfusions of blood may be necessary. Severe anemia also may require blood transfusions. Careful attention to the oral hygiene may prevent ulceration of mucous membranes. A well balanced nutritious diet with added vitamins should be given. The object of the treatment is to support the patient until the body has had opportunity to destroy or eliminate the drug and regain normal function.

BLOOD DISTURBANCES FROM SULFANILAMIDE

DR. CATTELL: When blood disturbances develop in the course of treatment with sulfanilamide and its derivatives, what are the criteria for deciding whether or not to continue the treatment?

DR. FORKNER: Under such conditions one must try to determine whether the effects are due to the drug or to the disease itself. Usually if acute hemolytic anemia or acute agranulocytosis occurs, the drug should be discontinued promptly and not resumed. It is important to make blood counts frequently in cases in which sulfanilamide derivatives are being administered. A differential count and a red blood cell count are the most important parts of the study, since they may change in an unfavorable direction before the total white cell count or hemoglobin values are altered significantly. A marked drop below normal in the percentage of neutrophils or a sharp fall in the red blood cell count is a danger signal. The appearance of jaundice, the result of hemolysis, or ulceration of the mucous membranes, the result of agranulocytosis, usually means that the process is well advanced. These signs may be avoided in some cases if careful attention has been focused on the percentage of neutrophils and the total number of erythrocytes during the course of treatment.

DR. JANET TRAVELL: Do barbiturates containing a ring nucleus, like phenobarbital, injure the blood?

DR. GOLD: Phenobarbital has been included among agents causing agranulocytosis. There is little doubt about its potentiality in that direction by reason of its ring formation, but the evidence that such effects have been produced is not satisfactory.

SUMMARY

DR. CATTELL: The blood and the blood forming organs exhibit a special susceptibility to foreign substances. Toxic effects have been reported for the greatest diversity of chemical agents, effects which simulate most of the known disorders of the blood. A striking characteristic of poisoning of this nature is great difference in individual susceptibility, and because a widely used drug only occasionally gives rise to blood dyscrasias the affected person is usually regarded as having an "idiosyncrasy" toward that drug. It is questioned whether this represents a qualitatively different reaction, for those individuals may be at the end of the scale of a wide distribution curve.

It appears that there is but meager knowledge of the mechanism concerned in the blood changes produced by drugs, or of the conditions which determine special susceptibility. It has been observed experimentally that deficient diets increase the toxicity of various drugs, and there is evidence that in some instances this is related to vitamin intake.

The problem is important from the standpoint of industrial toxicology and of the therapeutic administration of drugs, and because it complicates the picture from a diagnostic point of view. In treatment the dangers of toxic manifestation from a drug must be weighed against its therapeutic value. The primary consideration in treatment is the early recognition of the blood changes so that the offending drug may be discontinued or the patient removed from the source of poisoning. Treatment is almost entirely symptomatic and has as its objective the support of the patient until the body has had opportunity to eliminate the drug and regain normal function. The most important single measure is transfusion. A well balanced, nutritious diet should be given, and added vitamins are probably of value. In cases of chronic lead poisoning it is not recommended that the patient be deleaded but rather that storage of lead in the bones be promoted by giving a high calcium diet and vitamin D.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE.

THE COUNCIL DESIRES TO EXPRESS ITS APPRECIATION TO DR. R. R. NEWELL FOR THE PREPARATION OF THIS ARTICLE AND TO THE CONSULTANTS ON ROENTGEN RAYS FOR THEIR ASSISTANCE. THE CONSULTANTS ON ROENTGEN RAYS ARE DRS. A. U. DESJARDINS, CHAIRMAN, WILLIAM E. CHAMBERLAIN, A. C. CHRISTIE, E. C. ERNST, GIOACHINO FAILLA, T. A. GROOVER, F. M. HODGES, G. W. HOLMES, J. T. MURPHY, R. R. NEWELL, E. P. PENDERGRASS, U. V. PORTMANN, L. S. TAYLOR AND J. L. WEATHERWAX.

HOWARD A. CARTER, Secretary.

COUNCIL INSPECTION OF ROENTGEN RAY APPARATUS

R. R. NEWELL, M.D.

SAN FRANCISCO

The Council on Physical Therapy has long considered the practicability of investigating roentgen apparatus. The radiologists asked by the Council to serve as consultants in considering this question are of the opinion that, while there is no gross imposition on the part of American manufacturers of roentgen apparatus against which radiologists need protection, there are many dangers connected with the use of roentgen apparatus by physicians who know very little about it. The following statements summarize the opinions of the consultants:

Modern "shock-proof" and "ray-proof" roentgen ray apparatus is available in a size and at a price that makes roentgenoscopy and roentgenography attainable for almost any doctor. The trained radiologist has sufficient knowledge of the physics and engineering of his specialty to protect himself (if he will) against poor equipment made by a careless or incompetent manufacturer. However, the physician not so trained may need protection by official inspection of apparatus advertised for sale.

It may be true that a physician not having enough training in radiology to conduct his own inspection should not be using a roentgen unit. It may also be true that, instead of having the manufacturer submit the apparatus for Council investigation, the physician who will use the unit might well submit himself to the American Board of Radiology for examination. Nevertheless, to blurt out these truths to a physician who asks the Council for guidance might only serve to hurt his feelings. It would not offer a solution to the practitioner in a small town who wishes to give his patients the benefit of roentgenology as well as the benefits of surgery, otology, dermatology, ophthalmology and all the other specialized skills and knowledge medi-

Dr. Groover died April 20, 1940.

From the Department of Radiology, Stanford University Medical School.

cine is developing—as far as he can master them, when consultation is not available.

If the Council should undertake investigation of roentgen units, limited perhaps to mobile or portable units designed for practitioners who do little radiology, some assurance could be given the purchaser concerning the following necessities:

(*a*) Electrical safety:

1. Grounding of case of transformer, control and tube holder, and grounded sheath to high tension cables.
2. Absence of excessive leakage in the insulating materials.
3. Proper circuit-breakers and/or fuses against overloads.

(*b*) Ray protection conforming to National Bureau of Standards Handbook 20. There is a special danger in the small apparatus, lest the tubeholder be in contact with patient or nurse. Leakage of ray must be less than 5 per cent of the 50 cm. beam intensity at all places where a hand can be put (outside the cone), as well as being less than 10^{-5} roentgens per second at all points 1 meter distant.

(*c*) Assurance that the machine gives the quantity and quality of roentgen rays represented.

(*d*) For oil-filled roentgen ray apparatus, assurance that expansion chambers are sufficient to take up heat expansion of the oil without production of bursting pressures (maximum kilovolt, milliampere and time being labeled on the case).

(*e*) A switch requiring to be held on during the exposure, so as to eliminate the possibility of the tube's being left turned on indefinitely.

(*f*) An arrangement to prevent roentgen rays being produced, or at least getting out, except when a cone for say 10 inches minimum target-skin distance is attached.

(*g*) A 2 milliameter aluminum filter fixed in place (or sufficient added to window, oil, and so on, to give half value layer at least 2 milliameters of aluminum).

Even with these precautions, it is impossible to prevent an inexpert doctor from burning himself or his patient, as many have done in the past. There is grave question in my mind whether the assurance given by Council acceptance may not prove rather productive of danger than of safety.

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

HOGAN #8870 BREVATHERM ACCEPTABLE

Manufacturer: McIntosh Electrical Corporation, Chicago.

The Hogan #8870 Brevatherm is recommended for medical and minor surgical diathermy. The unit is mounted in a polished wood cabinet which provides storage space in the lower portion. The cabinet size is 44 inches high, 22 inches wide and 16⅛ inches deep. The weight of the complete unit is 127 pounds.

The wavelength is 12 meters, the frequency 25 megacycles, the oscillator circuit two tubes, tuned grid, tuned plate, push-pull, the plate supply a full wave rectified current. The tubes consist of two 866-A rectifier and two HF-175 oscillator tubes. Three pairs of outlets are marked as follows: "Diathermy and Surgery," "Air-Spaced," "Cable." The diathermy outlets are used for pad technics and minor surgery. Inductive coupling is used for pads and air-spaced electrodes, capacitative coupling for the cable.

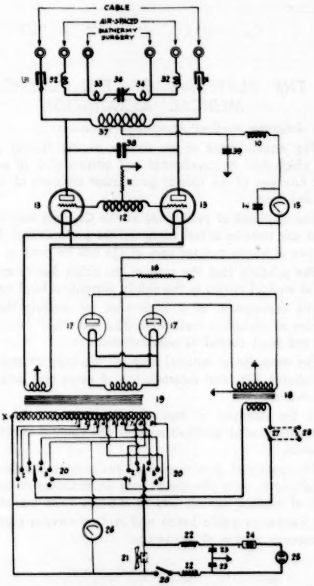
The power and oscillatory plant is enclosed in metal; the firm claims that this feature decreases the radiation of high frequency power from the oscillatory circuit. A ground connection on the back of the unit is provided to ground the metal housing. The firm states that provisions for minimizing radio interference are made.

To prevent high frequency energy from entering the power line, the firm states that an extra line filter system of choke coils and filter condensers is built into the apparatus.

An exhaust fan provides forced draft ventilation. By means of an autotransformer and tap switch, line voltage adjustment can be made to suit voltages varying from 90 to 135 volts. This feature makes it possible for full output to be derived at high or low line voltage conditions. Correct line voltage is indicated by a voltmeter on the panel.

The dosage in the patient's circuit may be regulated by the power output control switch. Six steps of voltage are delivered to the plate circuit of the tubes. The milliammeter employed on the Brevatherm registers the amount of direct current milliamperage which is delivered to the plate of the power tubes. A treatment timer regulates the duration of treatment from zero to sixty minutes.

The #8870 Brevatherm may be supplied with treatment arms and air-spaced electrodes. Each treatment arm has four friction joints; two joints of the friction ball type are self supporting and the other two are manually adjusted with knobs. The arms are constructed of insulating material containing jacks to



Schematic diagram of circuit.

hold cord tips of air-spaced electrodes in position when these are not in use. A cord clamp maintains the alinement of the cord during treatment. The lower metal portion of the treatment arms is grounded to the chassis to prevent pickup of electrical energy from the metal. A neon bulb surmounts each treatment arm and indicates when the circuit is tuned to resonance.

For use in surgical diathermy, a foot switch receptacle is located at the rear of the apparatus; the foot switch cord is also shielded and grounded to the metal chassis.

Evidence for deep tissue temperature measurements was submitted by the firm for the Premier Model superseded by the #8870 Brevatherm, which has a similar circuit. The firm claims the output of the unit to be 500 watts; tests conducted by the Council found a 490 watt output. This discrepancy is within the limits of experimental error. The temperature of the transformer operating on this load came within the requirements of the Council. The Council's clinical investigation of the apparatus revealed that the apparatus gave satisfactory clinical service.

The Council voted to accept the Hogan #8870 Brevatherm for inclusion on its list of accepted devices.

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SATURDAY, AUGUST 3, 1940

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

ACCURATE BLOOD TESTS FOR SYPHILIS

More and more states are passing laws requiring premarital examinations. Twenty of these laws require a physical examination of both sexes as well as blood tests for syphilis. Antepartum examination laws requiring serologic tests have been enacted in eighteen states. The passage of these laws is an important step in the control of syphilis. However, the effectiveness of their application depends on the reliability of the serologic tests employed in making or ruling out a diagnosis of syphilis.

The physician who makes the examination is held responsible for the decision made in the case even though the basis for his diagnosis may rest largely on the results of serologic studies. This fact makes it necessary for him to know the accuracy of such serodiagnostic tests.

Serodiagnostic evaluation studies carried out during the last four years by the U. S. Public Health Service and state departments of health have shown conclusively that many laboratories have not met the minimum standard of efficiency of serologic test performance.

An assembly of laboratory directors and serologists which was attended by representatives from state, municipal and private laboratories was held in Hot Springs National Park, Ark., in October 1938. This meeting was sponsored jointly by the Committee on Evaluation of Serodiagnostic Tests for Syphilis and the U. S. Public Health Service. The representatives who attended this meeting agreed that a satisfactory serologic test for syphilis is one which has a specificity rating of at least 99 per cent and a sensitivity rating not more than 10 per cent below that of the test as performed simultaneously by the author or control serologists. This definition is arbitrary, but any definition of a satisfactory test must necessarily be arbitrary at this time. The present conception of a satisfactory test is, however, believed to be reasonable.

The first serodiagnostic evaluation study, made in 1937, showed that many laboratories of the country were operating at a questionably satisfactory or totally unsatisfactory level of efficiency with regard to sensitivity and specificity. In 1938 the results reported by ten state laboratories closely approximated the results of the control laboratories, and five additional laboratories reported results which were considered satisfactory. The performance of one or more tests in thirty states, however, was unsatisfactory.

In the 1939 investigation three state laboratories reported results comparable to those of the control laboratories. This number was in addition to the ten laboratories whose performance was comparable to the control laboratories in 1938 but which did not participate in 1939. Thirteen additional laboratories did satisfactory tests, but the performance in one or more tests in twenty-three laboratories was unsatisfactory.

These studies show gradual improvement in the efficiency of many state laboratories, but the level of efficiency of local laboratories which perform serologic tests in many states is as yet undetermined. Studies of the efficiency of serologic test performance such as those conducted by the Committee on Evaluation of Serodiagnostic Tests for Syphilis offer the only practical means now known to determine the comparative efficiency of each laboratory. The physician who considers the welfare of his patients will insist that the laboratories in his state participate in well organized performance studies. Every physician should know the sensitivity and specificity rating of the laboratory to which he sends his specimens.

Physicians should not be satisfied with a satisfactory rating of the state health laboratories alone but should demand intrastate studies of the performance of serologic tests in municipal, hospital and private laboratories. After a state laboratory has been rated as satisfactory,

it is in a position to act as a control laboratory for intrastate studies of other laboratories. It should also be in a position to advise and assist other laboratories in bringing their efficiency up to an acceptable standard and to maintain this standard once it has been reached.

If the laboratories within a state are rated according to the efficiency of the test performed as superior, satisfactory or unsatisfactory, the physician will be able to choose a laboratory on which he can safely rely. At present, under the new premarital laws, few states will accept the reports of serologic tests performed in other states because the efficiency of the serologic work is unknown. The evaluation and rating of laboratories in the various states should eventually result in the reciprocal acceptance of the reports of serologic tests performed in other states.

Support by the medical profession of this attempt to improve the performance of serologic tests for syphilis will not only aid in the better administration of the various laws pertaining to the control of syphilis but will also serve as a stimulus to the improvement of serodiagnostic methods throughout the country. For the first time in the history of the United States it is possible for laboratories to ascertain the reliability of their serologic test performance not only on the basis of comparison of results in different laboratories but also on the basis of serologic results as contrasted with the known clinical diagnoses of the donors of the specimens.

DOUBLE BARRELED SELF MEDICATION

Even the old Food and Drugs Act required declaration on the label of the amount of acetanilid in a remedy. As a result some, but not all, manufacturers replaced acetanilid with acetophenetidin (phenacetin), acetylsalicylic acid and other drugs. Now comes the new Food, Drug and Cosmetic Act, which requires declarations of all active ingredients. Furthermore, this legislation requires the declaration of the amounts of some drugs, and included in this list are both acetanilid and acetophenetidin. A number of preparations on the market have combined the "virtues" and, more significantly, the dangers of acetophenetidin and significant amounts of bromides. Such preparations are doubly dangerous; they accustom the user to the taking of bromides and thus insure a continued dosage of acetanilid. The results in some cases have been disastrous. Unlike the old act, the new Food, Drug and Cosmetic Act requires qualitative and quantitative declaration of the presence of bromides. Thus the new act has clearly indicated that these drugs are sufficiently potent to require quantitative declarations on the label. There is, however, a stipulation in the new act which has been considered to be applicable to such a combination when it is promoted directly to the public. Quoting from the new act:

> SEC. 502. A drug or device shall be deemed to be misbranded —(j) If it is dangerous to health when used in the dosage, or with the frequency or duration prescribed, recommended or suggested in the labeling thereof.

A release of the United States Department of Agriculture dated March 28, 1939, included the following sentence:

> Actions against drugs alleged to be dangerous and to violate the new law included 3 bottles of Cal-Co-Din, a pain-killer containing cinchophen; 488 packages of B. C. Headache Powders, 11,325 bottles of Bromo-Seltzer, and 3,526 packages of Stanback Headache Powders, all of which contained, among other ingredients, bromides and acetanilid.

It is noteworthy that the seizure of BC Headache Powders referred to above has resulted in a Notice of Judgment being issued on the basis that the powders "would be dangerous to health when used in the dosage or with the frequency or duration prescribed, recommended or suggested in the labeling," and because the "labeling failed to reveal facts material with respect to the consequences which might result from the use of the article under the conditions of use . . . and failed to bear warnings against use in pathological conditions where its use might be dangerous to health or against unsafe dosage or duration of administration." The company was granted a petition to withdraw its claim and answer. Judgment of condemnation was entered and the product was ordered destroyed.

In a circular letter addressed to a layman, the manufacturer of "BC" Headache Powders suggests the use of this remedy for the relief of pain and discomfort due to headache and neuralgia. It is also claimed to be effective for the relief of muscular aches, discomforts due to simple head colds, and as a sedative in "simple nervousness." This letter was received quite recently. Enclosed in the letter was a sample which contained such warnings as "May be repeated in 3 or 4 hours. Do not use more than two powders in any 24-hour period. Not for use by children." And finally, "When pains of this character persist, or recur frequently, consult a physician." Possibly these warnings would be interpreted to mean that the use of the preparation should not be continued or repeated. The warnings become less effective, however, when the advertising contains such statements as "The test of time (30 years) and the distribution of millions of packages have established the merit of 'BC' and gained for it the wholehearted acceptance on the part of many people in all parts of the nation."

Drugs like acetanilid and the bromides are useful when prescribed by the physician in an individual case to meet certain immediate requirements. Such use is not comparable to promiscuous use by the layman. Useful Drugs, a publication addressed to physicians, states with regard to acetanilid:

> In poisonous doses acetanilid produces cyanosis, an abnormal reduction of temperature, coldness of the extremities and profuse sweating. In individuals with an idiosyncrasy toward the drug similar symptoms may be produced by small doses. It should be avoided or used cautiously in patients who are debilitated from any cause, especially those with heart disease. Acetanilid is effective for the relief of headache, neuralgic pain, and for the aches and pains of the febrile patient, but is not suited to the treatment of pain caused by inflammation. It has

been exploited widely as a universal analgesic in various mixtures and under different names. Many so-called headache powders contain it; its indiscriminate use in such forms is dangerous.

Dosage: 0.2 Gm. (3 grains). It is well to begin with 0.1 Gm. (about 1½ grains), and to repeat cautiously.

Note that it is suggested that the physician start with 1½ grains. These manufacturers start patients about whose physical condition they know nothing with 2½ grains. Useful Drugs also says concerning potassium bromide:

Actions and Uses: Potassium bromide is a sedative for the nervous system. It diminishes reflex excitability and depresses the motor area of the cortex. In large doses it is depressant to the circulation. When continued long it disturbs the nutrition and may produce irritation of the skin similar to that produced by the use of iodides.

It is to be emphasized that these cautions are for the proper and scientific use of these drugs when they are employed by physicians. THE JOURNAL continues to insist on the danger of placing preparations containing such drugs in the hands of the public. However thoroughly labeled, such a double barreled instrument of self medication represents infinite potentialities for harm through promiscuous use by the uninformed lay person.

Current Comment

CONSULTATION SERVICE BY MAIL

A recent opinion by the department of justice of Pennsylvania, published in the July issue of the *Pennsylvania Medical Journal*,[1] provides an interesting point of view regarding medical consultation by mail. In 1939 a Pennsylvania law was passed requiring an applicant for a marriage license to submit a statement from a duly licensed physician of the commonwealth certifying that the applicant is not infected with syphilis or, if infected, is not in a stage of the disease which is likely to become communicable. Any applicant having been denied a physician's statement may appeal to the department of health for a review of his case and the department may, after appropriate investigation, issue or refuse to issue a certificate in lieu of the required physician's certificate. To facilitate the review of such a case on appeal, the department of health proposed to utilize the facilities of the Institute for the Control of Syphilis of the University of Pennsylvania. This institute, it was contemplated, would be supplied with a statement of facts embodying the history of the applicant's case, his present physical condition, the results of serologic tests and other pertinent information. Solely on the basis of this statement, it was proposed, the institute would advise the department of health what action to take on the appeal. It was not contemplated that the applicant should be examined by members of the institute. The department of health further proposed, as a part of its venereal disease program, to make the services and facilities of the institute available to licensed physicians throughout the commonwealth for the purpose of consultation. It seems to have been the plan that any physician treating a person suspected of being infected with syphilis might submit to the institute a statement of the case and obtain a recommendation as to diagnosis and a proper course of treatment. Before the plan was put in operation, however, the department of health submitted it to the Pennsylvania department of justice, asking specifically whether the director or any individual member of the institute would incur civil liability "for giving advice by correspondence regarding the care of, or prescribing treatment for, a patient he has never seen or examined, if the advice actually results in unfavorable or injurious consequences to the person regarding whom it was given." The resulting opinion, formulated by Deputy Attorney General Fred C. Morgan, answers the question in the affirmative. While, the opinion points out, the identical question at issue had never been adjudicated in the commonwealth, the general principles applicable to the relationship between a physician and his patient clearly lead inevitably to the conclusion reached. Consultation among physicians is common practice but almost invariably the consultant is afforded the opportunity to and does examine the patient before making a diagnosis or suggesting treatment. To follow any other practice is to depart from the accepted procedure. The opinion points out that the Principles of Medical Ethics of the Association with respect to consultations obviously contemplate a personal relationship based on a physical examination by the consultant. The Judicial Council has repeatedly condemned as unethical the physician who without seeing a patient attempts to diagnose and to prescribe treatment by mail. After reviewing a number of court decisions involving analogous issues, the opinion concludes:

We have concluded that no physician, and particularly no expert, is entitled, under the law, to rely on the diagnosis of such a serious disease as made by another physician; that he cannot, with impunity, make a diagnosis or suggest indicated therapy for a patient he has never physically examined. The technic of diagnosis is too difficult, the ramifications of the disease too complex. From a study of the foregoing authorities, as well as from considerations of sound public policy and the rationale of malpractice liability, we believe that a consultant who does not personally confer with and examine a patient accepts at his peril statements and reports made to him by the attending physician. To hold otherwise would be to relieve the consultant of his burden to exercise the due care and diligence required of him by law; under such circumstances "due care" certainly contemplates and requires a diligent oral and physical examination of the patient. This is particularly true when the consultant, an expert in a particular field, relies on the observations and findings of one who is not a specialist.

We are of the opinion, therefore, and you are accordingly advised that the members of the Institute for the Control of Syphilis of the University of Pennsylvania would be liable for damages in an action of trespass for malpractice for making a diagnosis of, or prescribing treatment for, a patient they have never seen or examined, if such diagnosis or advice actually results in injurious consequences to the person regarding whom it was made or given.

1. Diagnosis or Treatment in Absentia Not Good Medical Practice, Pennsylvania M. J. **43**: 1473 (July) 1940.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

COMMITTEE ON MEDICAL PREPAREDNESS

Dr. Irvin Abell, Louisville, Ky., Chairman
Dr. Charles A. Dukes, Oakland, Calif.
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Dr. Stanley H. Osborn, Hartford, Conn.
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Dr. Olin West, Chicago, Secretary American Medical Association
Dr. Morris Fishbein, Chicago, Editor Journal of the American Medical Association

* Deceased.

COMMITTEE ON MEDICAL PREPAREDNESS

This committee was created by the House of Delegates of the American Medical Association to cooperate with the Advisory Commission on National Defense, the Army and Navy Medical Corps, the United States Public Health Service and all other federal agencies in preparing our nation medically to meet any emergency. The functions of the Committee include the following activities:

1. Meetings devoted to consideration of problems involved in providing medical personnel for military, naval and civilian needs.

2. Consideration of the provision of medical personnel for physical examination, particularly of young men who are conscripted for medical service, young men assigned to vocational training, persons on relief and those concerned with war industries.

3. Consideration of economic problems including financial arrangements, leaves of absence, part-time service and other factors associated with civilian medical services.

4. To maintain contact and to represent the Association in conferences with the Surgeon Generals of the Army, Navy and Public Health Service and, when necessary, with other governmental agencies.

5. To maintain contact with the state chairmen on medical preparedness.

6. To encourage and coordinate the activities of the various state chairmen for the National Committee on Medical Preparedness.

7. To formulate instructions for the guidance of state chairmen.

8. To review and to approve or disapprove recommendations received from state chairmen.

Activities of State Chairmen and Committees on Medical Preparedness

The functions of the state chairmen for the state committees on Medical Preparedness are an extension of the functions initiated and developed by the national committee. The National Committee on Medical Preparedness includes representatives located in all of the various Army Corps areas and Naval districts. The state chairmen for the Committee on Medical Preparedness maintain contact with other state chairmen in their vicinity through the corps area representative of the national committee and maintain contact also with the headquarters office of the American Medical Association, which acts as headquarters for the National Committee on Medical Preparedness.

The functions of a state chairman include the following:

1. Contact with and coordination of the activities of state, county and district medical societies.

2. Cooperation with county medical societies in securing completion and return of the questionnaire on personal information.

3. To establish mechanisms for securing supplementary information to the questionnaire when necessary.

4. To organize a state committee on medical preparedness to be composed of the president and the secretary of the state medical society, the state chairman for the Committee on Medical Preparedness and ex officio the member of the Committee on Medical Preparedness of the American Medical Association within whose corps area the state is located and such other members as this group may select.

5. To assist in the organization of county committees on medical preparedness.

6. To invite local and state health authorities to participate in the work of the program particularly in the matter of civilian health.

7. To arrange for the dissemination of information on medical preparedness to the groups that are concerned with any particular matter.

8. To assist in the verification of the qualifications of physicians desired for service in the Army, industry, special physical examinations and other special work necessary for national defense.

9. To report to the Committee on Medical Preparedness a list of the names of physicians from each county of the state whose services are believed to be necessary for the maintenance of civilian health and who should, in the opinion of the state committee on medical preparedness, be exempt from military service.

State Chairmen

ALABAMA.—Dr. J. N. Baker, 519 Dexter Avenue, Montgomery.
ARIZONA.—Dr. Charles S. Smith, Nogales.
ARKANSAS.—Dr. W. R. Brooksher, 602 Garrison Avenue, Fort Smith.
CALIFORNIA.—Dr. Philip K. Gilman, 2000 Van Ness Avenue, San Francisco.
COLORADO.—Dr. John W. Amesse, 227 Sixteenth Street, Denver.
CONNECTICUT.—Dr. George M. Smith, Pine Orchard.
DELAWARE.—Dr. William H. Speer, 917 Washington Street, Wilmington.
DISTRICT OF COLUMBIA.—Dr. F. X. McGovern, 1835 I Street N. W., Washington.
FLORIDA.—Dr. Edward Jelks, P. O. Box 1018, Jacksonville.
GEORGIA.—Dr. Edgar H. Greene, 478 Peachtree Street N. E., Atlanta.
IDAHO.—Dr. J. N. Davis, 204 Fourth Avenue East, Twin Falls.
ILLINOIS.—Dr. Harold M. Camp, 224 South Main Street, Monmouth.
INDIANA.—Dr. Charles R. Bird, 23 East Ohio Street, Indianapolis.
IOWA.—Dr. T. F. Suchomel, 305 Second Street, Cedar Rapids.
KANSAS.—Dr. F. L. Loveland, 109 West Ninth Street, Topeka.

KENTUCKY.—Dr. Arthur T. McCormack, 620 South Third Street, Louisville.
LOUISIANA.—Dr. C. Grenes Cole, 921 Canal Street, New Orleans.
MAINE.—Dr. John G. Towne, 48 Elm Street, Waterville.
MARYLAND.—Dr. Charles W. Maxson, 827 North Charles Street, Baltimore.
MASSACHUSETTS.—Dr. Alexander S. Begg, 8 Fenway, Boston.
MICHIGAN.—Dr. Burton R. Corbus, 110 Fulton Street, Grand Rapids.
MINNESOTA.—Dr. F. L. Smith, 102 Second Avenue S. W., Rochester.
MISSISSIPPI.—Dr. T. M. Dye, Box 295, Clarksdale.
MISSOURI.—Dr. Robert Mueller, 3115 South Grand Avenue, St. Louis.
MONTANA.—Dr. Herbert T. Caraway, 115 North Twenty-Eighth Street, Billings.
NEBRASKA.—Dr. A. A. Conrad, Crete.
NEVADA.—Dr. C. W. West, 120 North Virginia Street, Reno.
NEW HAMPSHIRE.—Dr. Deering G. Smith, 77 Main Street, Nashua.
NEW JERSEY.—Dr. Charles H. Schlichter, 556 North Broad Street, Elizabeth.
NEW MEXICO.—Dr. L. B. Cohenour, 221 West Central Avenue, Albuquerque.
NEW YORK.—Dr. Samuel J. Kopetzky, 71 East Eightieth Street, New York.
NORTH CAROLINA.—Dr. F. Webb Griffith, Lake View Park, Asheville.
NORTH DAKOTA.—Dr. L. W. Larson, 221 Fifth Street, Bismarck.
OHIO.—Dr. Harry V. Paryzek, 25 Prospect Avenue N. W., Cleveland.
OKLAHOMA.—Dr. Henry H. Turner, 1200 North Walker Street, Oklahoma City.
OREGON.—Dr. Charles E. Hunt, 132 East Broadway, Eugene.
PENNSYLVANIA.—Dr. Charles H. Henninger, 500 Penn Avenue, Pittsburgh.
RHODE ISLAND.—Dr. Halsey De Wolf, 199 Thayer Street, Providence.
SOUTH CAROLINA.—Dr. Edgar A. Hines, Seneca.
SOUTH DAKOTA.—Dr. William Duncan, Webster.
TENNESSEE.—Dr. W. C. Dixon, 706 Church Street, Nashville.
TEXAS.—Dr. Holman Taylor, 1404 West El Paso Street, Fort Worth.
UTAH.—Dr. John F. Sharp, 75 South Main Street, Salt Lake City.
VERMONT.—Dr. Benjamin F. Cook, 46 Nichols Street, Rutland.
VIRGINIA.—Dr. Hugh H. Trout, 1301 Franklin Road, Roanoke.
WASHINGTON.—Dr. Raymond L. Zech, 509 Olive Way, Seattle.
WEST VIRGINIA.—Dr. Benjamin H. Swint, 240 Capitol Street, Charleston.
WISCONSIN.—Dr. R. E. Fitzgerald, 2750 North Teutonia Avenue, Milwaukee.
WYOMING.—Dr. George H. Phelps, 1606 Capitol Avenue, Cheyenne.
ALASKA.—
CANAL ZONE.—
HAWAII—
PHILIPPINE ISLANDS.—
PUERTO RICO.—Dr. O. G. Costa-Mandry, Department of Health, San Juan.

STATE SOCIETY CREATES MEDICAL PREPAREDNESS COMMITTEE

A Committee on Medical Preparedness, composed of eight New Jersey physicians, has been appointed by the Medical Society of New Jersey to assist the National Committee on Medical Preparedness appointed by the American Medical Association.

Members of the New Jersey committee are Drs. Charles H. Schlichter, Elizabeth, chairman; Harold D. Corbusier, Plainfield; Albert G. Hulett, East Orange; Andrew F. McBride, Paterson; David A. Kraker, Newark; Wells P. Eagleton, Newark; David B. Allman, Atlantic City, and Thomas K. Lewis, Camden. Dr. Norman M. Scott, 143 East State Street, Trenton, is secretary to the committee.

The purpose of these committees—state and national—is to determine by a survey the professional facilities available for a successful medicomilitary program which will at the same time assure continuity of adequate medical care for the civilian population during any national emergency.

A questionnaire form has been sent directly to each physician in the United States by the American Medical Association. The survey will permit classification of physicians according to qualifications as regards professional specialties, previous military experience, physical condition, and adaptability of the individual physician to the care of the civilian population or to the care of military personnel.

The State Committee on Medical Preparedness has requested each county medical society to appoint a parallel committee to supervise activities within its jurisdiction.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Society News.—Dr. Thomas C. Naugle, Gadsden, addressed the Etowah County Medical Society in Gadsden, June 18, on "Use of Sulfanilamide Compounds in Eye, Ear, Nose and Throat Treatment."——Dr. Seale Harris Jr., Birmingham, discussed "Practical Application of Some of the Newer Endocrine Products" before the Walker County Medical Society, June 14, in Jasper.

CALIFORNIA

Press Department to Be Established.—Resolutions were adopted by the council of the Los Angeles County Medical Association, June 3, which express the society's policy concerning public health education and approve the establishment of a department of press information, patterned after one operated by the New York Academy of Medicine. It will consist of a rotating voluntary committee of members of the association, selected for their qualifications in the various branches of medicine, sponsored by the sections and acting with the committee on public policy and relations together with the association officers. The group will give interviews to the press representatives by telephone or in person on pertinent medical matters, the names of the doctors to be used but not addresses or specialty, each to be a spokesman for the department and so announced in each press item. Each article published in the newspapers will bear the caption "This article is released in the interest of public health education and is approved by the Los Angeles County Medical Association."

COLORADO

Society News.—Dr. Constantine F. Kemper, Denver, addressed the Northeast Colorado Medical Society in Sterling, June 13, on pernicious anemia and recent advances in the treatment of ductless gland disorders.——Dr. Gerrit Heusinkveld, Denver, discussed "Subinvolution of the Uterus" before the San Luis Valley Medical Society in Monte Vista, June 18, and Dr. William H. Halley, Denver, policies of the state medical society.

Radiologic Conference.—The sixth midsummer radiologic conference, sponsored by the Denver Radiological Club, will be held at the Hotel Shirley-Savoy, Denver, August 8-10. Guest speakers include:

Dr. Howard B. Hunt, Omaha, Roentgenologic Aspects of Traumatic Disease in the Nervous System.
Dr. Fred E. Angle, Kansas City, Kan., Clinical Features of Brucellosis.
Dr. Howard P. Doub, Detroit, Tumors of the Small Bowel.

Dr. Albert Soiland, Los Angeles, Medical Aspects of Ultra Short Wave X-Rays.
Dr. Edwin C. Ernst, St. Louis, Mandibular Joint Syndrome.
Dr. Charles L. Martin, Dallas, Diagnosis and Treatment of Carcinoma of the Pharynx and Its Complications.
Dr. Lewis G. Allen, Kansas City, Kan., Radiation Therapy in Surgical Mumps.

A meeting Thursday evening will be a joint one with the Medical Society of the City and County of Denver with the following speakers:

Dr. Soiland, Value of the Radiologist to a Medical Community.
Dr. Ernst, Diseases and Their Roentgen Management.
Dr. Martin, Recent Advances in Radiation Treatment of Cancer.
Dr. Doub, Relationship of Industrial Trauma to the Formation of Hypertrophic Arthritis.

CONNECTICUT

Physician Honored. — Dr. James D. Gold, Bridgeport, president-elect of the Connecticut State Medical Society, was honored at a dinner given by present and former members of the council of the society to mark his retirement as chairman. Dr. Joseph I. Linde, New Haven, president of the society, presided. Dr. Gold was presented with an engraved pen and pencil.

DISTRICT OF COLUMBIA

Personal. — Drs. William Thornwall Davis and Tomas Cajigas, Washington, were decorated with the Order of Carlos J. Finlay recently at a reception at the Cuban Embassy. The presentation was made by Dr. Juan M. Moya, secretary of sanitation of Cuba.——Dr. Winfred Overholser, superintendent, St. Elizabeths Hospital, Washington, was awarded the honorary degree of doctor of science by Boston University, June 10.

Gift to Emergency Hospital.—The White Memorial Eye Operating Room, a gift from Mrs. Louise C. White in memory of her husband, George Whitney White, was recently dedicated at Emergency Hospital, Washington. The presentation was made by Dr. James N. Greear Jr., chief of the ophthalmic service at the hospital, on behalf of Mrs. White. Mr. White was a member of the board of directors of the hospital from 1910 until his death in 1938 and served as treasurer of the institution for seventeen years.

FLORIDA

State Board Officers.—Dr. Benjamin A. Chapman, Jacksonville, was elected president of the state board of medical examiners at a recent meeting in Tampa; Dr. Harold D. Van Schaick, Jacksonville, was named vice president, and Dr. William M. Rowlett, Tampa, was reelected secretary.

New Assistant State Health Director.—Dr. William H. Pickett, Clearwater, has been appointed assistant state health officer. The position was created on the recommendation of the American Public Health Association, following a survey of the health situation in Florida. Dr. Albert B. McCreary, Jacksonville, is state health officer. Dr. Pickett graduated at the Atlanta School of Medicine in 1911. His public health career includes two years spent as health officer of Pinellas County, two as health officer in Escambia County and eleven years as health officer first of Saginaw City and later of Saginaw County, Mich.

GEORGIA

Dr. Calhoun Honored. — The Fulton County Medical Society gave a dinner in honor of Dr. F. Phinizy Calhoun, Atlanta, at the Piedmont Driving Club, July 12, to mark his recent election as president of the American Ophthalmological Society. Dr. Calhoun graduated at Atlanta College of Physicians and Surgeons in 1904 and was professor of ophthalmology at Emory from 1912 to 1937.

Changes in Health Personnel. — Dr. Guy V. Rice Jr., Jesup, has resigned as health commissioner of Wayne County, effective June 15, to become medical director of the southwestern health region, with headquarters in Albany. He succeeds Dr. Lester M. Petrie, who has been transferred to the northeastern health region, Gainesville. Dr. Edward S. Armstrong, Cordele, resigned as commissioner of health in Crisp County, effective June 15, to become venereal disease control officer with the Savannah-Chatham County health department. Dr. Charles R. Smith, Morgan, has resigned as health commissioner of Calhoun County, effective July 1, to accept a similar position in Terrell County, succeeding Dr. Oliver W. Jenkins, Dawson.

ILLINOIS

Society News.—Dr. I. Pat Bronstein, Chicago, discussed "Endocrine Disturbances in Childhood" before the Madison County Medical Society in Madison, June 7.——Dr. Adrien H. Verbrugghen, Chicago, lectured on "Intractable Pain and Its Management" before the Kane County Medical Society in Geneva, June 12.——Dr. Melvin R. Guttman, Chicago, addressed the McHenry County Medical Society, July 25, on "Diagnosis and Treatment of Middle Ear Complications."——Dr. Charles F. Read, Elgin, was elected president of the Illinois Psychiatric Society at its annual meeting recently; Dr. Clarence A. Neymann, Chicago, was named vice president and Dr. Eugene I. Falstein, Chicago, secretary-treasurer.

Chicago

Course on Pediatrics.—The Children's Memorial Hospital will conduct a four weeks' graduate course in pediatrics, beginning September 30. The fee for the four weeks' course is $100. Registration should be made at least one month before entrance if possible and should be accompanied by a $10 deposit. This will apply on the fee for the course and will be refunded if the applicant is unable to participate. Inquiries should be addressed to Graduate Course, 707 Fullerton Avenue.

INDIANA

Pediatricians Elect Officers.—Dr. Kenneth T. Knode, South Bend, was elected president of the Indiana State Pediatric Society recently; Dr. John C. Burkle, Lafayette, vice president, and Dr. Matthew Winters, Indianapolis, secretary-treasurer.

Society News.—The Fountain and Warren Counties Medical Society was addressed at Covington, June 7, by Drs. Frank M. Gastineau and Norman M. Beatty, Indianapolis, on pathology and treatment of eczema. —— A symposium on "lessons learned during seven years with a tumor group" was presented before the LaPorte County Medical Society, June 20, by Drs. Harry E. Mock, Charles E. Shannon and John L. Lindquist, all of Chicago.——Dr. Robert L. Glass, Indianapolis, addressed the Tippecanoe County Medical Society, Lafayette, June 25, on "Herniation of the Intervertebral Disk."——Dr. Robert M. Moore, Indianapolis, was the guest speaker before the Gibson County Medical Society, Princeton, June 10, on "The Heart at Middle Age."——Dr. John S. Robison addressed the Randolph County Medical Society, Winchester, June 26, on "Fracture of the Neck of the Femur."

IOWA

Personal.—Dr. Francis A. Ely, Des Moines, has been made an honorary alumnus of Jefferson Medical College of Philadelphia. The honor was conferred to mark the gratitude of the university and its alumni to Dr. Ely's grandfather, the Rev. Ezra Stiles Ely, who, while serving as pastor of the Old Pine Street Presbyterian Church and as secretary of the additional board of trustees of the college, came to the rescue of the school when it was in financial difficulty.—— Dr. Lindsey J. Ervin, director of the venereal disease service at Broadlawns General Hospital, Des Moines, has been named temporary director of the Polk County health unit. He succeeds Dr. Edwin N. Hesbacher, who recently was appointed to the staff of the U. S. Marine Hospital in Detroit. Dr. Hesbacher served as director of the health unit for a year.

KENTUCKY

Changes in Health Officers.—Dr. Aubrey Y. Covington, Morganfield, has resigned as health officer of Union County to take a similar post in Scott County, with headquarters in Georgetown. Dr. Covington succeeds Dr. Carl M. Gambill, who has joined the staff of the state health department.—— Dr. Donald B. Thurber, Louisville, has been appointed health officer of Nicholas County, with headquarters at Carlisle, succeeding Dr. James W. Scudder, who has been appointed to the staff of the Western State Hospital, Hopkinsville.—— Dr. George B. Davis, Glasgow, recently health officer of Barren County, has been appointed to a similar position in Hart County.

Society News. — Dr. Irving J. Wolman, Philadelphia, addressed the Jefferson County Medical Society, Louisville, June 17, on "Advantages of Milk in the Diet."——At a meeting of the Warren-Edmondson County Medical Society in Bowling Green, May 29, the speakers were Drs. Alexander M. Forrester Jr., Louisville, on "Modern Treatment of Middle Ear

Disease"; Charles F. Wood, Louisville, "Injuries to the Knee Joint," and David Woolfolk Barrow, Lexington, "Treatment of Thrombophlebitis and Vascular Diseases of the Extremities."——Speakers at a meeting of the Harlan County Medical Society, Harlan, June 29, were Drs. Arthur T. McCormack, secretary of the Kentucky State Medical Association, on the service of physicians in national defense; Philip F. Barbour, heart disease in children, and Lytle Atherton, diseases of the kidney. All are of Louisville.

MAINE

State Medical Meeting and Election.—At the eighty-eighth annual session of the Maine Medical Association in Rangeley Lakes, June 23-25, Dr. Penry L. B. Ebbett, Houlton, was chosen president-elect and Dr. Thomas A. Foster, Portland, became president. Dr. Frederick R. Carter, Augusta, is the secretary. Included among the out of state speakers were the following:

Dr. David G. Cogan, Cambridge, Mass., Some Oculomotor Disturbances.
Dr. Trygve Gundersen, Boston, Diagnosis and Treatment of Some Corneal Conditions.
Dr. Ralph M. Tovell, Hartford, Conn., Pentothal Sodium: Its Field of Usefulness.
Dr. Meyer Saklad, Providence, R. I., Anesthesia and Disturbed Physiology.
Dr. Sven M. Gundersen, Hanover, N. H., Diabetes: The Problem from the Standpoint of the Internist.
V. W. Peterson, special agent in charge, Federal Bureau of Investigation, Boston, Modern Criminal Detection.
Dr. Moses Ralph Kaufman, Boston, Psychotherapy in General Medical Practice.
Dr. Henry C. Marble, Boston, Compound Injuries to the Hand.
Dr. Timothy Leary, Boston, Traumatic Intracranial Hemorrhages with Demonstration of Brains.

A clinicopathologic conference was conducted with Dr. Reginald Fitz, Boston, in charge. At the annual dinner, the speakers were P. S. Demers, Springvale, representing the Maine Pharmaceutical Association, and Gov. Lewis O. Barrows. Fifty year gold service medals were presented to Drs. Henry H. Brock, Portland, and Frederick B. Adams, now of Tampa, Fla. Dr. Leary and Franz U. Burkett, attorney general, Portland, were special guests of the Maine Medico-Legal Society in joint session with the medical examiners of the state.

MICHIGAN

"Cancer Specialist" Under Surveillance.—Edward La Motte, Garden, who represented himself as a "cancer specialist," pleaded guilty recently to a charge of practicing medicine without a license, according to the state medical journal. La Motte has been placed on probation for three years, during which time he must make monthly appearances before the judge who sentenced him to prove he is not practicing medicine in any form in Michigan, under penalty of spending six or more months in jail, it was stated.

Physicians Honored.—A public banquet was held in Northport, June 26, to honor Dr. Robert E. Flood on his seventieth birthday and completion of forty years of practice in the community. Nearly 200 persons attended the banquet, at which Dr. Burton R. Corbus, Grand Rapids, president of the Michigan State Medical Society, made the principal address. Dr. Flood received a testimonial plaque commemorating the occasion.——The Alpena-Presque Isle-Alcona Counties Medical Society gave a banquet, June 5, in honor of Dr. Clarence A. Carpenter as a tribute to his years of service in Onaway. He received several gifts. Dr. Carpenter has been practicing medicine for forty-two years. He has served as health officer in Onaway and was the first president of the Presque Isle County Medical Society before it became part of the tri-county organization.——Dr. Frank H. Bethell, Ann Arbor, was given one of the two annual Henry Russel awards at the University of Michigan, Ann Arbor, for his "direction of field studies of anemias of pregnancy in Hillsdale County" in cooperation with the W. K. Kellogg Foundation, newspapers recently reported. The awards are given to the young faculty members who show promise.

MINNESOTA

Illegal Practitioner Jailed.—John Taylor, alias "Hobo Jack," pleaded guilty in the district court of Benton County, June 12, to a charge of practicing healing without a basic science certificate. He was sentenced to pay a fine of $100 plus court costs of $23.15 or to serve ninety days in the county jail of Stearns County, Benton County having no county jail. Taylor was unable to pay the fine and the court remanded him to the custody of the sheriff to serve his sentence. Taylor was arrested June 7, and it was proved that he had been diagnosing the ailments of farm people and prescribing various medicines, the state board of medical examiners reported. He represented himself as "Hobo Jack," the unlicensed specialist, and claimed to be able to cure arthritis, disease of the prostate, hemorrhoids, stomach ulcers and many other ailments. Taylor admitted that he never studied medicine but that he had practiced unlawfully in California, Oregon and Washington. He said that he had never previously been arrested.

MISSISSIPPI

Society News.—The Northeast Mississippi Thirteen Counties Medical Society was addressed in Macon, June 11, by Drs. Otis B. Crocker, Bruce, "Practical Points in the Differential Diagnosis and Treatment of Appendicitis"; John C. Culley, Oxford, and Thomas H. Blake, Jackson.

Public Health Personnel.—Dr. Taswell Paul Haney Jr., who has been on leave of absence the past year from his position as director of the Pike County health department, McComb, has been appointed director of maternal hygiene and child welfare of the Mississippi State Board of Health. Dr. George E. Riley, Jackson, director of malaria control work in the state health department, has been named in charge of Pike County, and Dr. David B. Wilson, McComb, who has been acting director of the county unit, has accepted a position with the U. S. Public Health Service.

MISSOURI

The Robert James Terry Lecture.—The late Dr. William T. Coughlin, professor of surgery, St. Louis University School of Medicine, St. Louis, bequeathed $5,000 in his will to the St. Louis Medical Society to establish and maintain an annual lecture to be known as the "Robert James Terry Lecture."

New Director of Health of Kansas City.—Dr. Hugh L. Dwyer has been appointed director of health of Kansas City to succeed Dr. Edwin L. Schorer. Dr. Dwyer is professor of clinical pediatrics at the University of Kansas School of Medicine, Kansas City-Lawrence. He graduated at Tulane University School of Medicine, New Orleans, in 1918.

MONTANA

Sale of Drugs Restricted.—The Montana State Board of Pharmacy has announced that, effective July 1, certain drugs must be sold only on the prescription of regularly licensed physicians, dentists or veterinarians, newspapers reported June 29. Included in the list of drugs which are designated as "dangerous, hypnotic or habit forming" are aminopyrine, barbituric acid, amphetamine, cinchophen, sulfanilamide and sulfapyridine. The action of the state board of pharmacy was taken at the request of the state board of health and the Montana State Medical Association.

NEW JERSEY

Personal.—A portrait of Dr. Edward J. Ill, Newark, was unveiled at a dinner recently as an event of the seventy-fifth anniversary celebration of the Hospital of St. Barnabas for Women and Children, Newark. It will be hung in the hospital in recognition of Dr. Ill's fifty-eight years of service on the staff. Dr. Ill is 86 years old and is still practicing.

NEW YORK

Trichinosis Traced to Sausage.—Investigation of an outbreak of thirty-five cases of trichinosis in New York, New Rochelle and Mount Vernon showed that all the victims had eaten sausage called "teewurst," made of raw pork smoked at 85 F., for twenty-four hours. It appeared that all the sausage came from one dealer and the dates of purchase indicated that it was all from the same batch.

Annual Meeting at Lake Keuka.—The forty-first annual meeting of the Lake Keuka Medical and Surgical Association was held at Penn Yan, June 20-21. On the scientific program were the following speakers:

Dr. Theodore C. Erickson, Montreal, Management of Head Injuries.
Dr. Gershom J. Thompson, Rochester, Minn., Transurethral Prostatectomy.
Dr. Robert B. McGraw, New York, Shall We Have Fewer or More Psychiatrists?

Dr. Samuel H. Geist, New York, Practical Gynecologic Endocrinology. Dr. Neil W. Swinton, Boston, Diagnosis and Management of Precancerous Lesions of the Rectum and Colon.

Dr. Arthur W. Booth, Elmira, chairman of the Board of Trustees, American Medical Association, and Dr. Terry M. Townsend, New York, immediate past president of the Medical Society of the State of New York, opened the program with addresses.

New York City

Salmon Memorial Lectures Changed.—Because of the uncertainties of international transportation, Dr. Alexander Luria, Moscow, Russia, will not give the Salmon Memorial Lectures for 1940 and Dr. Nolan D. C. Lewis, director of the New York State Psychiatric Institute, has been appointed lecturer in his stead. The dates of the lectures have also been changed to November 8, 15 and 22. They will be delivered at the New York Academy of Medicine.

Health Center Areas Established.—The city planning commission has established thirty health center districts as locations for health centers, in accordance with a plan submitted by Dr. John L. Rice, city health commissioner, in May 1939. Dr. Rice's program called for construction of fourteen district health centers and twenty-three subcenters between 1940 and 1945 at an estimated cost of $7,550,000. When the report was submitted, nine new health centers were in operation, five were under construction and about $4,500,000 had been expended since 1934 on such projects.

Gifts to New York University.—Gifts including $28,247 for medical research were recently announced by New York University. Among them were:

John and Mary R. Markle Foundation, $2,850 for research under Dr. Norman H. Jolliffe, associate professor of medicine.

Metropolitan Life Insurance Company, $1,735, and two anonymous donors, $1,100 for research on pneumonia under Dr. Jesse G. M. Bullowa.

National Committee on Maternal Health, $1,870 for the Robert L. Dickinson research fellowship fund at the Washington Square College; $300 for the department of neurology, college of medicine.

Lederle Laboratories, $1,000 on a $4,000 grant for research on digitalis glucosides under Dr. Arthur C. DeGraff; $625 for the Lederle Fund.

Estate of James W. Keenan, $1,366.69 to establish a memorial fund for surgical research.

Commonwealth Fund, $4,266.65 on a grant to the department of preventive medicine; $3,798.75 for research in obstetrics and gynecology under Dr. William E. Studdiford Jr., and $2,150 for study of hypertensive and renal diseases under Homer W. Smith, Sc.D., department of physiology.

Rockefeller Foundation, $1,250 for research in cellular physiology under Robert Chambers, Ph.D., department of biology, Washington Square College.

International Cancer Research Foundation, $1,000 for research on cancer under Professor Chambers.

New York Foundation, $1,000 for the New York Foundation for Experimental Surgery under Dr. Benjamin G. P. Shafiroff, instructor in surgery, college of medicine.

Anonymous donor, $1,000 for research in therapeutics, college of medicine.

NORTH CAROLINA

Society News.—Dr. Otto Billig, Asheville, addressed the Buncombe County Medical Society, Asheville, June 17, on "Insulin Shock and Subshock Treatment in Mental Disease."——Dr. John Herman Long, Baltimore, addressed the Guilford County Medical Society, Greensboro, June 6, on "Chemotherapy in Gynecology" and "Endocrine Therapy in Gynecology."

Public Health Meeting.—Dr. John W. Williams, Williamston, was elected president of the North Carolina Public Health Association at the recent annual meeting in Pinehurst; Dr. Robert E. Rhyne, Gastonia, vice president, and Dr. John S. Anderson, Raleigh, secretary. Among the speakers were Drs. John A. Ferrell and Daniel F. Milam of the International Health Board of the Rockefeller Foundation; Joseph C. Knox, state epidemiologist, and Franklin C. Smith, Charlotte, who discussed vision testing in school children.

Symposiums on Obstetrics and Pediatrics.—A symposium on obstetrics and pediatrics was held at Roaring Gap, June 16-17, under the auspices of the state board of health and the postgraduate committee of the Medical Society of the State of North Carolina. Dr. Julius H. Hess, Chicago, discussed "Prematurity" and "Bronchiectasis in Childhood," and other speakers included Drs. Williamson Z. Bradford, Charlotte, "Toxemia of Pregnancy"; Thomas Leslie Lee, Kinston, "Placenta Praevia," and Francis Bayard Carter, Durham, "Ablatio Placentae."——A similar symposium was held at Wrightsville Beach, June 23, with the following speakers, among others: Drs. Edward A. Schumann, Philadelphia, on "Complications of Pregnancy Other Than Hemorrhage" and "Hemorrhage in Pregnancy and Labor"; Charles P. Mangum, Richmond, Va., "Pediatric Endocrinology"; Jay M. Arena, Durham, "Congenital Syphilis," and James Buren Sidbury, Wilmington, "Treatment of Diarrhea and Intestinal Intoxication."

OHIO

District Meeting.—The annual meeting of the eighth district of the Ohio State Medical Association was held at Rocky Glen Sanatorium, McConnellsville, June 20. The speakers on the scientific program were Drs. Chevalier L. Jackson, Philadelphia, on "Bronchoscopy and Bronchography as Aids in the Diagnosis and Treatment of Bronchopulmonary Diseases" and Andre Crotti, Columbus, "Some of the Latest Conceptions of the Cause of Cancer."

Personal.—Dr. George W. Crile, Cleveland, has been made an honorary member of the Academy of Medicine of Cleveland.——Dr. Reaves W. DeCrow, Columbus, has been appointed health officer of Clinton County.——Dr. George E. French has retired after thirty-seven years as health officer of Elyria, it is reported. Dr. Harold A. Robinson, Elyria, is his successor.——Dr. Abraham Strauss has been appointed chief of the surgical department of Mount Sinai Hospital, Cleveland, succeeding the late Dr. Moses E. Blahd.——Dr. Millard C. Hanson, health director of Toledo since April 1937, has resigned to become director of a syphilis control program in Pittsburgh.

Dr. Gebhard to Direct Health Museum.—Dr. Bruno Gebhard, former curator of the Hygiene Museum in Dresden, Germany, has been appointed director of the Cleveland Museum of Health and Hygiene, which is to open in October. Dr. Gebhard left Germany in 1937 and has been serving as technical consultant for the medicine and public health exhibits at the World's Fair in New York. Plans for the museum were launched in 1939 when Mrs. Francis F. Prentiss donated a building for the purpose and the Cleveland Academy of Medicine carried out a campaign for supporting memberships. In addition to exhibits for education in public health, the museum expects to have workshops for the creation of visual health aids for schools, colleges and other educational agencies.

OKLAHOMA

Care of Crippled Children.—Aided by a grant from the Children's Bureau, the Oklahoma Commission for Crippled Children has established a rheumatic fever and heart service. The work is carried out through the department of pediatrics of the University of Oklahoma School of Medicine and the Crippled Children's Hospital, Oklahoma City. Clinics are held and eight beds have been set aside in hospitals for patients with active infection. A new ward of sixteen beds has been opened in the Crippled Children's Hospital for Negro children.

OREGON

Personal.—Dr. Adolph Weinzirl, Portland, was elected president of the Oregon Health Officers' Association at the recent annual meeting in Astoria. Dr. Abraham A. Merkel, Medford, is vice president and Dr. A. Edward Bostrom, Portland, secretary.——Dr. Wilbur M. Bolton, Portland, was elected president of the Alumni Association of the University of Oregon Medical School at the recent annual meeting. Dr. Edmund H. Berger, Portland, was elected secretary.——Dr. Harold M. Erickson, The Dalles, has been appointed director of the division of maternal and child health in the state board of health to succeed Dr. George D. Carlyle Thompson, Portland, who resigned to take a position with the U. S. Children's Bureau.

PENNSYLVANIA

District Meeting.—The Sixth Councilor District of the Medical Society of the State of Pennsylvania met in Birmingham, July 11. On the scientific program were Drs. Joseph D. Findley, Altoona, speaking on "The Present Status of Industrial Medicine," and Howard A. Power, Pittsburgh, "Prophylactic Management of Obstetric Difficulties." Drs. Charles H. Henninger, Pittsburgh, president of the state society; Walter F. Donaldson, Pittsburgh, secretary, and Chauncey L. Palmer, Pittsburgh, chairman of the committee on public health legislation, and John J. Shaw, state secretary of health, Harrisburg, made addresses, and fifty year testimonial certificates were presented to Drs. William H. Banks, Mifflintown, Charles M. Johnson, McVeytown, Brooklyn B. Levengood, Bellwood, and Henry W. Sweigart, Lewistown.

Philadelphia

Alumni Reunion Plans.—The 1911 class of the University of Pennsylvania School of Medicine will hold its thirtieth reunion, Thursday, September 19, at Pine Valley Country Club, Clementon, N. J. Information about accommodations may be obtained from Dr. John P. Chapman; information about the university's bicentennial program from Dr. Thomas Grier Miller. Class dues of $10 may be sent to Dr. Wilbur H. Haines, secretary, 255 South Seventeenth Street.

Osler Memorial Dedicated.—The old autopsy house at the Philadelphia General Hospital, where Dr. William Osler worked from 1885 to 1889, has been restored to be used as a museum of Osleriana and was dedicated in June. Eleven resident physicians who served with and under Dr. Osler were present, as was Dr. Howard A. Kelly, Baltimore, the only living member of the famous group who served with Osler at Johns Hopkins. Dr. Joseph McFarland, who was resident physician at the hospital, then known as Blockley, in 1889, spoke on "Osler as I Knew Him," and Dr. William G. MacCallum, Baxley professor of pathology, Johns Hopkins University School of Medicine, Baltimore, a former pupil, spoke on "Osler at Blockley." Other speakers were Dr. William E. Hughes, physician at the hospital from 1889 to 1914 and now honorary consultant, and Dr. William E. Robertson, who paid tribute to Dr. David Riesman, one of those most active in the establishment of the memorial. Dr. Riesman died a week before the dedication. An important feature of the ceremonies was the unveiling of a painting by Dean Cornwell, "Osler at Old Blockley," for John Wyeth & Brother, Inc., who also financed the restoration of the building.

RHODE ISLAND

Society News.—The Providence Medical Association was addressed, June 3, by Drs. Roland Hammond on "The Oldest Scientific Book in the World—The Edwin Smith Surgical Papyrus," and Ira C. Nichols, "Delirium as a Danger Signal." ——At the annual spring clinic of the Providence Hospital Intern Alumni Association the guest speakers were Drs. Paul L. Cusick, Rochester, Minn., on "Ophthalmic Examinations from the Viewpoint of the General Practitioner" and Harry L. Alexander, St. Louis, "Physical Examination of the Patient, Stressing Emphysema."

TEXAS

District Meeting.—The Southwest Texas District Medical Society (Fifth and Sixth districts) held a meeting in McAllen, June 28-29, with the following speakers, among others:

Dr. Walter G. Stuck, San Antonio, Fractures of the Hip.
Dr. Edward W. Coyle, San Antonio, Collapse Therapy in the Treatment of Pulmonary Tuberculosis.
Dr. Sidney W. Bohls, Austin, Some Problems in Virus Disease in Texas.
Dr. George Van Amber Brown, McAllen, Drainage in Abdominal Surgery Based on Physiologic Principles.
Dr. Hugh D. White, Monterrey, Mexico, Spinal Anesthesia.
Dr. Ulysses S. Marshall, Weslaco, Symptoms and Physical Findings in Typhus Fever.

VIRGINIA

Special Society Meeting.—The Neuropsychiatric Society of Virginia held its spring meeting at St. Albans Sanatorium, Radford, June 19. Speakers included Drs. John C. Palmer of the sanatorium staff on "Experiences with Insulin and Metrazol in the Treatment of Eighty Psychotic Patients" and James N. Williams, Richmond, gave an interpretation of drawings made by maladjusted children.

WASHINGTON

Poliomyelitis in Pierce County.—The outbreak of poliomyelitis in Tacoma and Pierce County continues, but there are indications that it has passed its peak, according to *Northwest Medicine* for July. Eighty cases had occurred up to June 26. Nine patients had been treated in respirators and seven deaths had occurred. Less than one fourth of the patients suffered any paralysis, the report said. One case has been reported in King County and one in Kitsap County. Both of these had contacts in Pierce County. Sporadic cases have been reported from Snohomish County and the Grand Coulee district, it was said. Dr. Don W. Gudakunst, medical director of the National Foundation for Infantile Paralysis, is conducting an epidemiologic study.

WEST VIRGINIA

Society News.—Dr. James Edwin Wood Jr., Charlottesville, Va., addressed the Cabell County Medical Society, Huntington, June 13, on "Recent Experimental Studies in Hypertension and Their Relation to Practical Problems." —— Dr. John W. Holloway, Cleveland, addressed the Kanawha County Medical Society, Charleston, June 4, on "Surgical Diseases in Children."——Dr. John M. Meredith, Charlottesville, Va., addressed the Logan County Medical Society, Logan, June 5, on "Treatment of Acute Head Injuries."——At a meeting of the Monongalia County Medical Society, Morgantown, June 4, the speaker was Dr. Delmas E. Greeneltch, Wheeling, on spinal anesthesia.

WISCONSIN

Society News.—Drs. Robert von der Heydt and Oliver E. Van Alyea, Chicago, were guest speakers at a meeting of the Central Wisconsin Society of Ophthalmology and Otolaryngology at Land o' Lakes June 8-9.

Institutes on Diseases of the Chest.—A series of ten one day institutes on diseases of the chest will be presented during the weeks of August 5 and 12 under the sponsorship of the Wisconsin Anti-Tuberculosis Association, the committee on chest diseases of the State Medical Society of Wisconsin, the state board of health and Wisconsin sanatoriums. The institutes are financed by a fund left to the tuberculosis association by the late Dr. Hoyt E. Dearholt, Milwaukee, executive secretary for many years. The speakers who will take part are Drs. John A. Carswell, associate executive secretary of the tuberculosis association, and Arthur A. Pleyte, director of its medical department, Milwaukee; Herbert H. Christensen, Wausau; Harold M. Coon, Statesan; Frank L. Jennings, Indianapolis; John D. Steele Jr., Milwaukee, and Reuben H. Stiehm, Madison. The institutes will be held at sanatoriums in Winnebago, Plymouth, Whitelaw, West DePere, Wausau, Bayfield, Eau Claire, Onalaska, Janesville and Racine.

WYOMING

State Medical Meeting in Sheridan.—The annual meeting of the Wyoming State Medical Society will be held in Sheridan, August 11-13, under the presidency of Dr. John H. Goodnough, Rock Springs. Guest speakers will be:

Dr. Arthur E. Hertzler, Halstead, Kan., Uterine Prolapse.
Dr. Kenneth D. A. Allen, Denver, Practical Considerations of Certain Diseases of the Cervix Uteri with Relation to Prevention of Cancer.
Dr. Frederick R. Harper, Denver, Some Practical Points in the Treatment of Empyema.
Dr. Claude F. Dixon, Rochester, Minn., The General Practitioner's Role in Certain Intestinal Diseases.
Dr. Kemp G. Cooper, Denver, Gastroscopy and Its Use in the Diagnosis of Stomach Pathology.
Dr. Charles F. Moon, Omaha, Management of Labor in the Primipara.
Dr. Peter T. Bohan, Kansas City, Mo., Arthritis: Special Reference to Etiology and Management.
Dr. Charles Douglas Deeds, Denver, Recent Advances in the Treatment of Heart Disease.
Dr. Ralph M. Stuck, Denver, A Review of the Surgical Treatment of Hypertension.

In addition, Wyoming speakers will be:

Dr. Earl E. Whedon, Sheridan, Tonsillectomy Experiences in Private Practice.
Dr. Robert I. Bump, Cheyenne, Cyclopropane as an Anesthetic Agent.
Dr. Edward B. Speir, Cheyenne, Surgical Procedures in the Colon and Rectum.
P. R. Carlquist, Cheyenne, The Services of the Public Health Laboratory.

HAWAII

Territorial Meeting and Election.—Dr. Paul Withington, Honolulu, was elected president of the Hawaii Territorial Medical Association at the recent annual meeting on Maui. Vice presidents were elected as follows: Drs. Gardner Black, Honolulu; Charles Bruce Brown, Hilo; Yen P. Chang, Lihue, and Ransom J. McArthur, Wailuku. Dr. Alfred L. Craig, Honolulu, was elected secretary. Dr. Isidor S. Ravdin, Philadelphia, was the guest speaker, discussing "Problems of Acute Appendicitis" and "Nutritional Problems in Surgical Patients."

PUERTO RICO

Society News.—Dr. Antonio Navas-Torres, San Juan, addressed the San Juan County Medical Society, June 28, on "Aniseikonia, a Great Promise in the Treatment of Asthenopia." ——Dr. Jacobo Simonet, San Juan, was elected president of the General Antituberculosis Association of Puerto Rico at its annual meeting, June 30, and Dr. Oscar G. Costa-Mandry, San Juan, vice president.——Dr. George Draper, New York, addressed the Puerto Rico Medical Association recently on "The Man Within the Patient."

GENERAL

Interstate Malaria Survey.—States of the Upper Mississippi Basin are cooperating with the U. S. Public Health Service in an interstate malaria survey, which began the first week in July and will continue through the summer and fall. The work is administered by a board made up of the health commissioners of the states concerned, Minnesota, Wisconsin, Illinois, Missouri and Iowa, with Dr. Walter L. Bierring, Des Moines, Iowa, as chairman. Joseph A. LePrince, for many years sanitary engineer with the public health service, is directing the survey. Headquarters for the project are in the Federal Building, Rock Island, Ill.

Institute for Traffic Safety Training.—The third National Institute for Traffic Safety Training, sponsored by the National Safety Council and ten other interested organizations, will be held at the University of Tennessee, Knoxville, August 12-24. The institute provides short courses for advanced safety students, including the following topics, among others: advanced methods of adult driver training, traffic safety education in schools, traffic accident reports and records. There will also be general meetings to discuss the standard highway safety program. Information may be obtained from Mr. Sidney J. Williams, 20 North Wacker Drive, Chicago.

National Medical Association.—The forty-sixth annual meeting of the National Medical Association will be held in Houston, Texas, August 12-16, jointly with the National Hospital Association and the National Insurance Medical Examiners Association. There will be several joint sessions with panel discussions and addresses by representatives of the American Medical Association, the Texas State Medical Association and the National Bar Association. Medical, surgical and pharmaceutical sections will meet Tuesday, Thursday and Friday. Dr. Albert W. Dumas Sr., Natchez, Miss., is president of the association and Dr. John T. Givens, Norfolk, Va., is secretary.

Advisory Board for Palestine Medical Program.—Hadassah, the women's Zionist organization in the United States which has sponsored the building of the Rothschild-Hadassah-University Hospital and Medical School in Palestine, recently announced a medical advisory board to advise the organization on professional problems arising from the hospital, child welfare and public health activities. Dr. Ephraim M. Bluestone, New York, is chairman of the board, which includes also Drs. Jacob J. Golub, Sigismund S. Goldwater, Emanuel Libman and Nathan O. Ratnoff, Maurice B. Hexter, Ph.D., all of New York; Dr. Jonas S. Friedenwald, Baltimore; Louis I. Dublin, Ph.D., New York, and Abel Wolman, D.E., Baltimore.

Fellowships in Chemistry.—For the academic year 1940-1941 Abbott Laboratories has established fellowships in several universities with important departments of organic chemistry and biochemistry. The fellowships, carrying stipends of $650 a year, will be available to graduate students in the last or next to last year of graduate work leading to the doctorate degree. The recipients, who are to be selected by the universities in which their work is being done, are not limited as to the subjects on which they will work. The object of the fellowships is to provide means for the carrying on of additional scientific work in American universities. Grants for work in organic chemistry will be made to Cornell, Harvard, Illinois and Michigan universities and in biochemistry to California, Columbia and Cornell.

Cancer Society Offers Prizes for Poster.—A nationwide competition for posters designed to stimulate public interest in the control of cancer has been announced by the American Society for the Control of Cancer. Prizes amounting to $1,875 will be awarded by a jury of artists, publicists and scientists. The National Alliance of Art and Industry will receive the posters from October 1 to 12, the awards will be made October 14 and the best posters will be exhibited for two weeks beginning October 16 in the National Arts Club, 15 Gramercy Park. The competition is open to all artists and art students. A contestant may submit as many designs as he wishes. Artists who wish additional information about cancer or the work of the American Society for the Control of Cancer may obtain literature from the society at 350 Madison Avenue. Details about the competition may be obtained from the National Alliance of Art and Industry, 119 East Nineteenth Street, New York.

Board Examinations in Ophthalmology.—The American Board of Ophthalmology announces that the only written examination in 1941 will be held in various cities March 8. Candidates enrolled in the preparatory group who have been advised that they will be eligible for examination during 1941 should make application at once to take this written examination. Applications must be made on the regular blanks provided for the purpose and must be received in the office of the board before December 1. Oral examinations will be held in Cleveland in May or June 1941, and in October at another place to be announced later. The deadline for case reports for the Cleveland examination is Feb. 1, 1941, and for the October examination, July 1, 1941. A special oral and clinical examination will be held on the Pacific Coast during 1941 provided there are enough candidates to warrant it. Applications for this examination should be filed before September 1940 so that the board may complete necessary arrangements.

Society News.—New officers of the American Laryngological Association elected in May include Drs. Gordon Berry, Worcester, Mass., president; Charles T. Porter, Boston, and Gordon F. Harkness, Davenport, Iowa, vice presidents.—Dr. Jack C. Norris, Atlanta, Ga., was elected president of the American Association of Medical Milk Commissions at the annual meeting held jointly with the Certified Milk Producers' Association in New York in June. Dr. Paul B. Cassidy, Philadelphia, was elected secretary of the association of milk commissions.—Dr. Henry J. Walton, Baltimore, was elected president of the American College of Radiology at its annual meeting in New York, June 12, and Dr. Sherwood Moore, St. Louis, vice president; Dr. Hollis E. Potter, Chicago, was reelected treasurer, and Mr. Mac F. Cahal, Chicago, was reelected executive secretary. The next annual meeting of the college will be held in Cleveland on Wednesday during the week of the annual session of the American Medical Association.

Provisional Mortality Rates for 1939.—The Bureau of the Census announces that provisional tabulations of deaths in continental United States in 1939 show a crude death rate of 10.7, as compared with 10.6 for 1938. The bureau points out that the apparent increase may be due to the use of the 1938 estimate of population in computing the 1939 rate and that the difference may disappear or be reversed when the new census figures are available. Rates for individual states are computed on 1937 estimates of population and are therefore higher for some states than they would be if computed on 1939 estimates. Twenty states show lower crude rates in 1939 than in 1938, twenty-one states and the District of Columbia show higher rates and seven states show no change, the report said. The greatest decreases occurred in Rhode Island, South Carolina, Georgia, North Carolina, Alabama and Arizona; the largest increases in the District of Columbia, Idaho, Iowa and Montana. The highest rates were for Arizona (14.2 per thousand of population), New Mexico (14.1), District of Columbia (13.2) and Florida (12.8). The lowest rates were for North Dakota (7.7), Oklahoma and South Dakota (8) and Arkansas (8.1). The report emphasized that differences in crude death rates do not necessarily indicate corresponding differences in health conditions. Age, sex and racial distributions are factors that affect the crude death rate, and these distributions differ in the various states.

FOREIGN

Personal.—The Osler Memorial Medal of the University of Oxford, England, was recently awarded to Sir E. Farquhar Buzzard, regius professor of medicine in the university.—The Académie de médecine, Paris, has awarded the Helme Prize to Dr. André Gratia, professor of bacteriology, Liége University, for his work on bacteriophages.

Prize for Encephalitis Research.—The University of Berne, Switzerland, recently announced its annual prize for work on encephalitis lethargica which "signifies real progress in the diagnosis or treatment of the disease." Those who wish to participate should send their applications to the dean of the Medical Faculty of Berne, which allocates the prize at the end of each year.

Sir James Barrett Honored.—A portrait of Sir James Barrett, who was associated with the University of Melbourne, Australia, for more than forty years until his retirement in 1939, was recently presented to him by the university council and staff, medical graduates and other citizens. Sir James, who presented the portrait to the university, began his career with the university as demonstrator in physiology and later was appointed lecturer in the physiology of the special senses, an office which he held for some forty years. In 1901 he became a member of the university council, in 1931 vice chancellor and in 1935 chancellor. Sir James has served not only the medical school and the university, but the city of Melbourne in widely diverse fields. He has been active in the development of musical affairs and is known as a naturalist.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 3, 1940.

A New Industry—Growing Vegetable Drugs

Because of the use of shipping for the importation of munitions, space for the carriage of the large amount of food imported is restricted and therefore more food is being grown at home. Similarly the scarcity of certain imported drugs from the cutting off of supplies from enemy or occupied countries has led to a movement for the growing of drugs which previously were imported. Operators on the New York drug market are scouring the world for new sources of vegetable drugs, and the same can be said of the London drug market. With supplies cut off from a large portion of central Europe, the Netherlands, Belgium and Italy and with shipments from France and Mediterranean countries disorganized, most of the world's production of vegetable drugs is denied to the majority of consumers. It is curious that America, with its variety of soils and climates, pays tribute to foreign nations for the bulk of the raw materials for the remedies its population consumes so abundantly. It is also remarkable that few varieties of vegetable drugs are cultivated on a large scale in the British Empire and that production in the British Isles is trivial. It has therefore been suggested that, just as amateur gardeners are now adding substantially to the country's supply of food, so it should be possible for them to market considerable quantities of the many vegetable drugs which grow well in the soils of Great Britain and Ireland. Plans have already been made for more intensive cultivation on medicinal plant farms which exist in England. The pharmaceutic, Linnean (botanic) and chemical societies are taking an interest in the project.

The Canadian Red Cross Hospital

The Canadian Red Cross Hospital for sick and wounded Canadians occupies 22 acres on Viscount Astor's estate near Taplow. This ground was occupied by a Canadian hut hospital in the last war and has been leased to the Canadian Red Cross by Lord Astor at a rent of a quarter of a dollar a year. The cost of erecting and equipping the hospital (the equipment is still incomplete) is about $1,000,000. There are fifteen wards, each accommodating thirty-six or, in an emergency, fifty beds, which are reached by a long corridor running the whole length of the building. There is a special wing for officers and a complete operating block and x-ray department. The furniture is of Canadian maple in early colonial design. Each ward opens on a sun porch. There are four operating rooms and special clinics for dental, eye, ear and nose cases. A special laboratory is being furnished to the requirements of Sir Frederick Banting, the eminent Canadian who is director of the pathologic department. The officers connected with the hospital include Col. George G. Nasmith, former health officer in Canada, who was attached to the mobile field laboratory of the British Expeditionary Force in 1915 and is now deputy commissioner of the Canadian Red Cross Society in London; Major C. A. Scott, Assistant Commissioner; Col. R. M. Luton, senior medical officer with the Canadian Forces; Major J. C. McKenzie, general superintendent of the Montreal General Hospital, and Col. C. L. T. Arthur, a well known Winnipeg physician, who is in charge of the staffing of the hospital. The matron-in-chief of the Canadian Military Nursing Services is Miss E. F. Pense, who served as a nurse with the Canadians in the last war.

Sir Arthur Harden

Sir Arthur Harden, F.R.S., late head of the Biochemical Department of the Lister Institute and emeritus professor of biochemistry, London University, has died at the age of 75. In 1929 the Nobel prize for chemistry was divided between him and Professor von Euler of Stockholm. In 1935 he was awarded the Davy medal of the Royal Society for his work in biochemistry and especially for his discoveries in fermentation. In 1906 he discovered that the fermentation of sugar depended on a specific activator which was not an enzyme and which was essential for the process. He also discovered that phosphates were an equally necessary factor. From 1913 to 1937 he was joint editor of the *Biochemical Journal*.

BUENOS AIRES

(From Our Regular Correspondent)

June 24, 1940.

Diphtheria Carriers

The National Council of Education ruled in 1933 that children attending schools, who have reported sick with diphtheria, shall be examined as to the presence of Loeffler's bacilli in the throat every eight days until two consecutive negative results have been obtained. Since 1937 these bacteriologic examinations have consisted in cultures in Horgan and Marshall's medium with 0.16 per cent tellurite, observed twenty-four hours after inoculation. Dr. Rietti has reported to the Argentine Society of Biology the results of 11,921 cultures made in 5,840 cases; 877, 15 per cent, showed bacilli in the throat. In slightly more than one third of the cases the bacilli disappeared in one week, in 20 per cent in two weeks, in 16 per cent in three weeks and about 1 per cent became negative in the eighth, ninth and tenth week respectively. In isolated cases they persisted for fourteen and sixteen weeks.

Antihookworm Campaign

Hookworm infestation is common in the province of Corrientes and in the territories of Misiones, Chaco and Formosa, and on a lesser scale in certain districts of northern Santa Fe, Salta, Jujuy and Tucuman; isolated foci have been reported in other parts of the country, but the disease is prevalent only in the Northeast along the Paraná River. The national public health department and the provincial health departments have carried out a well planned campaign for several years. The surveys made by Professor Fülleborn and especially by Prof. Alois Bachmann laid the foundation for this work. Recently Dr. C. Fonso-Gandolfo, professor of infectious diseases in the University of Buenos Aires, made a tour of cities on the Paraná in Corrientes and the Chaco accompanied by several physicians and eighty students in two gunboats lent by the naval authorities. Indexes of infestation were made and numerous lectures on the prophylaxis of ancylostomiasis were delivered. Great publicity was given this survey during the fourteen days it lasted. Prophylaxis is being carried out by building sanitary latrines, periodic disinfestations and the education of the public in the use of shoes, as most people in the affected districts do not wear them. In other parts of the country, where shoes are usually worn, there is no hookworm infestation.

New Tuberculosis Hospital

The municipal authorities of the city of Buenos Aires have inaugurated a hospital for tuberculosis which has been built with a donation of 1,600,000 pesos (about $465,000) made by F. Santojanni. The hospital will bear the donor's name.

Personals

Prof. D. Staffieri, incumbent of the chair of clinical medicine, has been elected dean of the medical faculty in Rosario.

Prof. Pio del Río Hortega has been invited to give a series of lectures and a practical course of normal and pathologic histology in the Medical School of the University of Buenos Aires.

ITALY

(From Our Regular Correspondent)

July 15, 1940.

Antituberculosis Vaccination

The presidents and directors of the antituberculosis centers of the various Italian provinces met recently at Rome on the occasion of the the tenth antituberculosis crusade. The advisability of an early administration of preventive antituberculosis vaccines, especially in the first month of life, was generally admitted. It was resolved to give the vaccines systematically to nurslings in crèches as well as to those who are cared for in pediatric centers. The national institution for the protection of mothers and their infants as well as the General Center of Public Health gave instructions to the pediatric provincial centers of both the institution and of public health to give systematically antituberculous vaccination to newborn infants under the care of the centers.

Lecture on Syphilology

Prof. Lodovico Tommasi, who recently took charge of the chair of dermosyphilology at the University of Naples, in his opening lecture discussed the racial and demographic problems of syphilology. He defines race as the unity of moral and physical qualities and factors which are transmitted to the offspring and are perpetuated in the next generations according to genetic laws. So-called hereditary syphilis is congenital syphilis. Some believe that the living virus, syphilitic toxins and toxic syphilitic influences may taint the first, second and third generations. Still others believe in possible mutations of syphilitic toxins with the preservation of transmissible pathologic characters. Modern syphilology, however, does not admit hypotheses. The interpretation of the pathologic phenomena of syphilis is correct only when the spirochete is given the entire direct responsibility as the causal agent of the lesion. So-called parasyphilis, which is a coined word to express a prespirochetal phase, and the so-called syphilotoxins do not exist. Syphilis is one of the less toxic infections. Congenital syphilis is transmitted by the mother in the majority of cases. Syphilis in women may be of two types: the type which follows a course similar to syphilis in man and that which is not apparent, with no lesions showing the port of entry and without symptoms. The latter type is discovered through serologic tests for syphilis or by lesions of late appearance in rare cases. It shows more frequently in the offspring. The type of unapparent syphilis has been experimentally reproduced in animals by means of repeated inoculation with subinfecting doses. Congenital syphilis can be of the unapparent type and later on transmitted to the next generation. However, the transmission of syphilis to the third or fourth generation is exceptionally rare. In fact, it is not accepted by many syphilologists. According to modern knowledge congenital syphilis is acquired in intra-uterine life. The differential characters of congenital syphilis in relation to those of syphilis acquired during adult life depend on the tropism that the spirochete has for structures, including endocrine glands, during intra-uterine growth. They have no toxic dystrophic origin. However, in rare cases of congenital syphilis of the parents, especially parents with congenital syphilis of the first generation, a blastophthoria of Forel's type may taint the germinal cells and will result in the development of certain phenomena of dysplasia and dystrophy. The phenomena will appear later on, alone or in association with congenital syphilis. They are not influenced by antisyphilitic therapy. The speaker concluded that syphilis does not taint the race which remains insensible to the external attacks of the spirochete. Yet, from a demographic point of view, it causes much harm. The most recent Italian statistics show that congenital syphilis alone produces an annual rate of 30,000 deaths and that 10,000 are born with one or several deficiencies. In association with acquired syphilis it causes an annual toll of 70,000 deaths and the presence in the country of about 750,000 syphilitic patients as sources of infection to the population.

Cinematography of the Larynx

Drs. Motta and Canova of Rome reported recently to the Accademia Medica of Rome the results of cinematographic researches on the larynx. They used an arc lamp placed beside the cinematographic apparatus in such a manner as to have the smallest angle between the luminous rays and the optic control of the objective. They carried on cinematography with the laryngoscopic mirror by this method. They registered the normal larynx of singers during the emission of vocal sounds, the larynx during phonation with the false cords and the vocal cords of persons with paralysis of a vocal cord or with some other diseases of the cords. The technic is simple.

Deaths

Prof. Giuseppe Sanarelli is dead. He was professor emeritus of hygiene at the University of Rome, of which he was ex-dean, Dr. ad honorem of the Universities of Paris and Tolosa, and professor of hygiene at the Universities of Bologna and Rome. Early in his professional life he wrote articles on his work at the Pettenkofer Institute in Munich and the Golgi Institute in Pavia and of his work with Pasteur in Paris. His work on immunity against anthrax contains two discoveries: the conception of opsonins and the introduction in the biologic technic of collodion sachets, which had an important development. Later at the request of the government of Uruguay he organized the Instituto de Higiene of Montevideo, where he carried on researches on yellow fever. He isolated Bacterium icteroides, the bacteria first found in the paratyphoid group. He discovered the virus myxomatosis in rabbits (Sanarellia cuniculi), a discovery which represents the cornerstone for the development of the history of filtrable viruses. He was deputy to the parliament in five legislatures and a senator.

Marriages

STANLEY C. USALIS, Kenilworth, Ill., to DR. MARGARET MARY VIDAS of Chicago in Windsor, Ont., Canada, July 14.

BROWN HUTCHESON CARPENTER, Danville, Va., to Miss Mary Harrison Vaughan of South Boston, June 29.

DAVID A. GERSHENSON, Fairfield, Ill., to Mrs. Lucille Pomeroy, of Carmi, in Reno, Nev., May 18.

ALBERT RITCHIE GILLESPIE, Charlottesville, Va., to Miss Louise Curtis of Ahoskie, N. C., May 25.

CLARENCE CONWAY BRISCOE, Philadelphia, to Miss Mary Elizabeth Suttle of Cynwyd, Pa., July 6.

HAROLD B. HENNING, Nashville, Tenn., to Miss Carolyn Prendergast of Chattanooga, June 28.

WILLIAM STONE HALL to Miss Oxena Elizabeth Gunter, both of Columbia, S. C., June 29.

ROBERT P. BOGNIARD, Ashland, Ohio, to Miss Mary Jane Nutter of Chesterhill, July 21.

JOHN BART LAURICELLA to Miss Dorothy Marie Donahue, both of New York, June 29.

ROBERT C. ORTON, New York, to Miss Edith Gersicoff of Rochester, N. Y., June 29.

OWEN F. PATTERSON, Springfield, Ohio, to Miss Mildred Senff of Wooster, June 11.

FLETCHER S. SLUDER JR., Danville, Pa., to Miss M. Orva Yost of Jeddo, June 30.

GEORGE S. BERGH to Miss Patricia Stephenson, both of Minneapolis, June 15.

DONALD BRINK, Isle, Minn., to Miss Margaret Johnson of Duluth, June 29.

MARVIN A. MITCHELL to Miss Nancy Stair, both of Atlanta, Ga., June 29.

Deaths

Arthur Stephen Hamilton, Minneapolis; University of Pennsylvania Department of Medicine, Philadelphia, 1897; member of the Minnesota State Medical Association; Secretary of the Section on Nervous and Mental Diseases of the American Medical Association from 1915 to 1918 and 1920-1921; instructor of neuropathology from 1904 to 1912, clinical instructor and assistant professor of nervous and mental diseases from 1905 to 1912, associate professor from 1912 to 1916 and later professor, and director of the division of nervous and mental diseases, at the University of Minnesota Medical School; formerly professor of nervous and mental diseases at the University of Minnesota Graduate School; past president of the Hennepin County Medical Society, the Central Neuropsychiatric Association and the Minnesota Academy of Medicine; member of the American Neurological Association, American Psychopathological Association and the American Psychiatric Association; served during the World War; was on the staffs of the University, Swedish, Abbott, St. Andrew's, St. Mary's, Fairview, Asbury and Northwestern hospitals; aged 67; died, June 2, of arteriosclerosis and encephalomalacia.

Eben Clayton Hill ✠ Captain, U. S. Army, retired, Baltimore; Johns Hopkins University School of Medicine, Baltimore, 1907; entered the medical corps of the U. S. Army as a first lieutenant in 1909 and retired as a captain in 1913 for disability in line of duty; assistant in anatomy, 1907-1908, instructor, 1920-1921, and associate in anatomy, 1921-1922, at his alma mater; for many years on the staff of the Vassar Hospital and Dispensary, Poughkeepsie; fellow of the American College of Physicians; aged 58; died, June 15, in the Burbank Hospital, Fitchburg, Mass., of coronary thrombosis.

David Perla ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1923; member of the American Association of Pathologists and Bacteriologists and the American Society for Experimental Pathology; an instructor at his alma mater; co-author, with Dr. Jessie Marmorston, of "Spleen and Resistance"; aged 39; since 1927 associate pathologist and bacteriologist on the staff of the Montefiore Hospital, where he died, June 14, of rheumatic heart disease.

William Henry Donnelly, Brooklyn; McGill University Faculty of Medicine, Montreal, Que., Canada, 1903; assistant professor of pediatrics at the New York Post-Graduate Medical School and Hospital, New York, from May 1924 to June 30, 1934; appointed instructor in pediatrics in June 1920 and associate in pediatrics in June 1922; aged 58; died, June 22, in a hospital at Montreal, Que., Canada, of hypertension and myocarditis.

George Leman Collins ✠ Medical Director, United States Public Health Service, retired, Washington, D. C.; Harvard Medical School, Boston, 1900; served as a first lieutenant in the Medical Corps of the U. S. Army in 1902; entered the United States Public Health Service in 1903 and retired in 1933; fellow of the American College of Surgeons; aged 66; died, June 17, in the Emergency Hospital, of acute dilatation of the heart.

Andrew Frank Richards, Sparta, Tenn.; University of Tennessee Medical Department, Nashville, 1893; member and past president of the Tennessee State Medical Association; member of the House of Delegates of the American Medical Association, 1917-1918; served during the World War; for many years a member of the state department of public health; aged 74; died, June 14.

Thomas Bray Spence ✠ Brooklyn; College of Physicians and Surgeons, medical department of Columbia College, New York, 1893; fellow of the American College of Surgeons; served during the Spanish-American and World wars; attending surgeon to the Methodist Episcopal Hospital; consulting surgeon to St. John's Hospital; aged 72; died, June 19, of heart disease.

Joseph Sidney Morrison, Royal Oak, Mich.; Detroit College of Medicine, 1905; member of the Michigan State Medical Society; past president of the Oakland County Medical Society; for many years member of the board of education; aged 63; died, June 20, in the Oakland County Tuberculosis Sanatorium, Pontiac, following an operation for a pulmonary cyst.

Eugene George Kessler, New York; Columbia University College of Physicians and Surgeons, New York, 1898; member of the Medical Society of the State of New York; for many years consulting physician to the dispensary of the Lenox Hill Hospital; aged 73; died, June 20, of carcinoma.

J. Spencer Callen, Shenandoah, Pa.; College of Physicians and Surgeons, Baltimore, 1881; member of the Medical Society of the State of Pennsylvania; past president of the Schuylkill County Medical Society; for many years president of the board of education; aged 86; died, June 4, of senility.

Lloyd Edress Oaks ✠ Twin Falls, Idaho; Jefferson Medical College of Philadelphia, 1930; member of the Pacific Coast Oto-Ophthalmological Society; on the staff of the Twin Falls County General Hospital; aged 37; died, June 10, in a hospital at Denver of pulmonary tuberculosis.

Charles Francis King, McKeesport, Pa.; Medico-Chirurgical College of Philadelphia, 1910; member of the Medical Society of the State of Pennsylvania; aged 55; died, June 22, in the Graduate Hospital of the University of Pennsylvania, Philadelphia, of carcinoma of the bladder.

John Henry Jones, Dowagiac, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1893; member of the Michigan State Medical Society; for many years member of the board of education and city physician; aged 80; died, May 24.

James Wilcox Turner, Cedar Keys, Fla.; Medical Department of Tulane University of Louisiana, New Orleans, 1904; at one time acting assistant surgeon in the United States Public Health Service; formerly state senator; aged 62; died, June 21, of carcinoma of the prostate.

Frederick Clarence Hanmore, Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1906; member of the Illinois State Medical Society; police surgeon; aged 57; died, June 17, in the Wesley Memorial Hospital of pulmonary embolism and lung abscess.

Guy William Henika, Madison, Wis.; Harvey Medical College, Chicago, 1897; member of the State Medical Society of Wisconsin; deputy state health officer; formerly assistant state health officer; aged 69; died, June 8, of injuries received in an automobile accident.

Norman M. Johnson, Durham, N. C.; Washington University School of Medicine, Baltimore, 1877; member of the Medical Society of the State of North Carolina; formerly county health officer and county coroner; aged 87; died, June 13, of heart disease.

Alfred Anthony Keller, New Orleans; Medical Department of Tulane University of Louisiana, New Orleans, 1910; member of the Louisiana State Medical Society; on the staff of the Charity Hospital; aged 52; died, June 14, of coronary thrombosis.

Daniel Garver Kuhlthau ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1926; member of the American Academy of Dermatology and Syphilology; aged 39; died, June 3, in the New York Post-Graduate Hospital.

Augustus Frederick Kober ✠ Charles City, Iowa; University College of Medicine, Richmond, 1901; Northwestern University Medical School, Chicago, 1902; on the staff of the Cedar Valley Hospital; aged 65; died, June 6, of cirrhosis of the liver.

Joshua Raymond Storie, Cookeville, Tenn.; University of Tennessee Medical Department, Nashville, 1894; also a lawyer; formerly Fentress county judge and chairman of the board of education; aged 85; died, May 9, of chronic myocarditis.

Louis Andrew Derry, Portland, Maine; Medical School of Maine, Portland, 1906; member of the Maine Medical Association; fellow of the American College of Surgeons; on the staff of the Queen's Hospital; aged 60; died, June 16, of heart disease.

Harry Ernest Heinitsh Jr., Spartanburg, S. C.; Jefferson Medical College of Philadelphia, 1918; member of the South Carolina Medical Association; aged 45; on the staff of the Spartanburg General Hospital, where he died, June 20, of typhus fever.

Marion Ernest Quina ✠ Pensacola, Fla.; Medical Department of Tulane University of Louisiana, New Orleans, 1905; served during the World War; aged 57; on the staff of the Pensacola Hospital, where he died, June 12, of carcinoma of the lung.

Sam Harmon Taylor ✠ San Antonio, Texas; University of Texas School of Medicine, Galveston, 1924; served during the World War; aged 41; on the staff of the Santa Rosa Hospital, where he died, June 3, of coronary thrombosis.

Frank H. Garverich, Harrisburg, Pa.; University of Maryland School of Medicine, Baltimore, 1888; Jefferson Medical

College of Philadelphia, 1891; formerly county physician; aged 78; died, June 15, of arteriosclerotic renal disease.

Lawrence C. Nell, Gradyville, Ky.; Kentucky School of Medicine, Louisville, 1891; formerly state senator and state representative; aged 72; died, June 21, in the T. J. Samson Community Hospital, Glasgow, of cerebral hemorrhage.

Isidore Rutherford Lowenthal, New York; Memphis (Tenn.) Hospital Medical College, 1897; lunacy commissioner for New York County, 1926-1927; aged 67; died, June 3, in the Beth Israel Hospital of chronic myelogenous leukemia.

George Elbert Adams, Jacksonville, Fla.; Medical College of the State of South Carolina, Charleston, 1911; member of the Florida Medical Association; for many years county physician; aged 55; died, June 11, of coronary thrombosis.

John Robert Andrew Lang Jr., Reno, Nev.; Cornell University Medical College, New York, 1921; member of the Nevada State Medical Association; served during the World War; aged 43; died, June 1, of coronary thrombosis.

Manly Dufferin Caughey, Detroit; Michigan College of Medicine and Surgery, Detroit, 1905; member of the Michigan State Medical Society; aged 64; died, June 12, in the Harper Hospital of lobar pneumonia and myocarditis.

James Nelson Gill, Weaverville, N. C.; Vanderbilt University School of Medicine, Nashville, Tenn., 1889; formerly mayor and health officer; aged 78; died, June 5, in a hospital at Asheville of uremia and chronic nephritis.

Frank Albert King ✠ New York; Long Island College Hospital, Brooklyn, 1899; surgeon in the United States Public Health Service reserve; served during the World War; aged 67; died, June 13, of coronary thrombosis.

Leslie Eugene Kelton Sr. ✠ Corsicana, Texas; University of the South Medical Department, Sewanee, Tenn., 1897; on the staff of the Physicians and Surgeons Hospital; aged 70; died, June 19, of coronary occlusion.

James C. Norris, Augusta, Ky.; Homeopathic Hospital College, Cleveland, 1884; member of the Kentucky State Medical Association; aged 80; died, June 13, in the Hayswood Hospital, Maysville, of myocarditis.

Michael Robinson, San Francisco; Kentucky School of Medicine, Louisville, 1904; aged 67; died, May 3, in the Veterans Administration Facility of cerebral hemorrhage, arteriosclerosis and hypertension.

John Thomas William Rowe, New York; Bellevue Hospital Medical College, New York, 1885; member of the Medical Society of the State of New York; aged 81; died, June 7, of heart and renal disease.

Moses H. Clagett, Berea, Ky.; University of Louisville Medical Department, 1887; formerly mayor of Menno, S. D.; aged 79; died, June 10, in the Berea College Hospital of cardiorenal vascular disease.

Warren D. Cline, Williamstown, W. Va.; Eclectic Medical Institute, Cincinnati, 1886; aged 83; died, June 5, in the Marietta (Ohio) Memorial Hospital of diabetes mellitus and coronary occlusion.

Beuhler B. Richmond, Skelton, W. Va.; Louisville (Ky.) Medical College, 1901; member of the West Virginia State Medical Association; aged 64; died in June of myocarditis and cerebral sclerosis.

Charles P. Cook ✠ Ennis, Texas; Memphis (Tenn.) Hospital Medical College, 1895; on the staff of the Municipal Hospital; aged 68; died, June 14, of cerebral embolus and coronary occlusion.

Jasper Lee Jackson, Manchester, Ga.; Atlanta College of Physicians and Surgeons, 1902; member of the Medical Association of Georgia; aged 69; died, June 2, in a hospital at Atlanta.

Andrew Rufus Howell, North Little Rock, Ark.; Jefferson Medical College of Philadelphia, 1887; member of the Arkansas Medical Society; aged 76; died, July 19, of intestinal obstruction.

Harriet V. Bills Brooks, River Rouge, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1877; aged 89; died, June 7, of acute dilatation of the heart.

Samuel Oscar Wilder, Chatham, La.; Louisville (Ky.) Medical College, 1884; formerly member of the state legislature, postmaster and bank president; aged 83; died, May 2.

William C. Hale Jr., Dallas, Texas; Fort Worth School of Medicine, Medical Department of Fort Worth University, 1896; formerly county health officer; aged 64; died, June 12.

Charles F. Wharton, Richmondville, N. Y.; Albany Medical College, 1883; for many years health officer; aged 77; died, May 25, in the Parshall Private Hospital, Oneonta.

Isaac William Brown, Jackson, Miss.; Meharry Medical College of Walden University, Nashville, Tenn., 1905; aged 71; was shot and killed, June 21, by an unknown assailant.

Edgar Morgan Webster, Chicago; Starling Medical College, Columbus, 1884; formerly on the staff of the South Chicago Community Hospital; aged 80; died, May 9.

Boston H. B. Grayston, Huntington, Ind.; Chicago Medical College, 1875; member of the Indiana State Medical Association; aged 90; died, June 19, of pulmonary edema.

Ira Hamilton Miller, Louisiana, Mo.; Missouri Medical College, St. Louis, 1899; served during the World War; aged 63; died, June 6, of a self-inflicted bullet wound.

C. T. McDonald, Idabel, Okla.; Hospital College of Medicine, Louisville, Ky., 1905; aged 70; died, June 9, of carcinoma of the liver, hypertension and diabetes mellitus.

Allen Chapman Brown, Stanwood, Wash.; Missouri Medical College, St. Louis, 1895; member of the Washington State Medical Association; aged 76; died, May 18.

Richard Adolphus Harkins, Fort Smith, Ark.; University of Nashville (Tenn.) Medical Department, 1907; served during the World War; aged 59; died, May 16.

Max Feldman, Chicago; St. Louis College of Physicians and Surgeons, 1918; Chicago Medical School, 1922; aged 52; died, June 5, in an automobile accident.

Harold Austin Kraiss Mengle ✠ Blue Ball, Pa.; Temple University School of Medicine, Philadelphia, 1927; aged 40; died, June 21, of coronary embolism.

James Allen Cotton, Peoria, Ill.; (licensed in Illinois in 1899); aged 71; died, June 10, in the Methodist Hospital of bronchogenic carcinoma of the lung.

Clark Le Roy Warren, Hines, Ill.; Rush Medical College, Chicago, 1897; aged 69; died, June 25, in the Veterans Administration Facility of tuberculosis.

Warren T. Chase, Loup City, Neb.; Hahnemann Medical College and Hospital, Chicago, 1882; aged 80; died, June 12, of cardiovascular disease.

Howard M. Holverson, Boise, Idaho; Hahnemann Medical College and Hospital, Chicago, 1901; aged 66; died, May 20, of coronary thrombosis.

Perry Smith Holmes, Mountain Pine, Ark. (licensed in Arkansas in 1903); aged 67; died, June 20, of myocarditis, influenza and nephritis.

Amos Flint Blanchard, Jamestown, N. Y.; University of Buffalo School of Medicine, 1888; aged 75; died, June 1, of coronary thrombosis.

Ethelbert Reavley, Spirit River, Alta., Canada; McGill University Faculty of Medicine, Montreal, Que., 1887; aged 79; died, April 28.

J. Hermenegilde Raymond, Lyster Station, Que., Canada; Laval University Faculty of Medicine, Quebec, 1911; aged 54; died in April.

Kee Wakefield, Minneapolis; University of Wooster Medical Department, Cleveland, 1869; Civil War veteran; aged 97; died, May 8.

Robert Edgar Buswell, Calgary, Alta., Canada; University of Toronto Faculty of Medicine, 1908; aged 59; died, April 15.

Rufus A. Vaughan, St. Louis; University of Nashville (Tenn.) Medical Department, 1872; Civil War veteran; died, May 24.

Louis H. Wheeler, Tully, N. Y.; Baltimore Medical College, 1901; for many years health officer; aged 62; died, May 15.

Oscar A. Kent, Huntington, W. Va.; Baltimore Medical College, 1895; aged 69; died, June 14, of cerebral hemorrhage.

David Roland Livingstone, Melville, Sask., Canada; Trinity Medical College, Toronto, Ont., 1900; died, May 18.

Hal Sewell Armistead, Atlanta, Ga.; Memphis (Tenn.) Hospital Medical College, 1909; aged 52; died, May 12.

Robert S. Short, Garner, Ky. (licensed in Kentucky under the exemption law of 1885); aged 83; died, May 19.

Isaac D. Benson, Anguilla, Miss.; Memphis (Tenn.) Hospital Medical College, 1898; aged 67; died, May 11.

Jessie T. Knight, Ravenna, Texas; (licensed in Texas, under the Act of 1907); died recently.

S. S. Holtz, Plymouth, Ohio; Pulte Medical College, Cincinnati, 1877; aged 88; died, June 7.

Ernest Henry Cole, St. Louis; St. Louis Medical College, 1885; aged 82; died, May 22.

Bureau of Investigation

AN ELECTRICAL ENGINEER BLOWS A FUSE

Short Circuit in Pseudomedical Line Followed by Post Office Fraud Order

In the thirty-four years that the Bureau of Investigation has been functioning, farmers and mechanics, housewives and others who should know better have been found associated with the sales of "cures." Occasionally even scientists of standing in their own fields have not hesitated to encroach on that of medicine by proclaiming the "discovery" or development of some alleged miracle of healing. Typical is the case of Louis Bond Cherry of El Paso, Texas, said to be a retired electrical engineer.

Electrical engineer Louis Bond Cherry.

Cherry first came to the attention of the American Medical Association through a booklet written in fanciful style on his "Neuropo System of Restoring Health." This consisted of a chief nostrum "Neuropo" and supplementary products which, used singly or in combination, were represented to help bring about "rejuvenation" and to cure or relieve a wide variety of disorders. Among these were paralysis, locomotor ataxia, gonorrhea, prostatitis, pulmonary tuberculosis, pneumonia, diphtheria, mumps, chickenpox, scarlet fever, tapeworm, asthma, bronchitis, eczema, moles, warts, indigestion, blood poison, diabetes, pyorrhea, anemia, neurasthenia, pleurisy, neuralgia and even baldness.

Another advertising booklet, put out later by Cherry, was written, he said, "just a little past three A. M." on his fifty-third birthday:

> Must I speak and lay bare to the world those things which are ordinarily considered personal and kept secret?

After a long barrage of fantastic language he reached this firm resolve:

> Yes, I WILL DO IT! At last, I MUST AND WILL SPEAK! . . . For me to withhold the story of how I restored myself to health from the curse of disease, and how I became rejuvenated in an unbelievable measure, endowed with enabling vitality to work as high as eighteen hours a day could not be but considered a crime of omission against humanity, for which I could never hope to receive forgiveness or peace of mind. Though, dear reader, it may mean sore persecution for me from those whose "organized practices" such a simple and revolutionary discovery might financially disturb, NEVERTHELESS, I WILL TELL YOU MY STORY.

Skipping a few more vagaries, one comes to the more personal parts of Cherry's life story. From his boyhood on a Kansas farm, where he enjoyed a "rugged constitution and high vitality," he goes on to his career in the city, where, he relates, he worked in a machine shop, a factory and a power house "gaining the practical experience in electrical and mechanical engineering" and also pursuing the study of chemistry, electrochemistry, biochemistry and *medicine!* These activities, he says, depleted his energy, and an attack of influenza in 1918, followed by two attacks of pneumonia, left him with "a well defined case of tuberculosis." And then:

> As though in confirmation of the old saying, that "It never rains but it pours," I received from the hand of Fate, who wielded the razor while getting shaved, a cut on the upper lip, from which developed a syphilitic infection, which unfortunately was not discovered as such until the disease had progressed in my system for about three weeks. Alarmed beyond words at my plight, I sought the best medical advice I could get, and began taking "shots" of 606 or similar arsenical preparations, following each course of six with six shots of mercury, taking in all sixty of such dosages (thirty of each) until I began to wonder which I would ultimately evolve into, a thermometer or a barometer. During all of this time of medical treatment I could feel myself slipping toward the open grave, as it seemed, and from which there seemed no possible way of escape. I sought and consulted medical practitioners, "specialists" in their line, and received but the one general answer to my queries to the effect that *"there was no cure for tuberculosis or syphilis; that it could only be suppressed."*

Thus the services of medical science seem to have suspended entirely during Cherry's quest for relief. In fact, he adds:

> Depressed at the failure of the doctors to give me even temporary relief, or encouragement, I became desperate and concluded to attempt the compounding of a remedy for my tuberculosis as that was the disease which seemed the most serious, or, at least, caused me the greatest suffering and exhaustion.

As a drowning man will grasp at a straw, so Cherry took up with—of all things—what he calls the electron theory! But so did Albert Abrams and George Starr White and some other promoters of fantastic methods in medicine. And there, of course, "vibrations" enter the picture, together with "color waves." But what have these to do with "patent medicines"? Well, Cherry found in some book that the "value of any medicine or drug as a remedial agency depended upon the DISENGAGEMENT OF ENERGY IN THE HUMAN BODY CORRESPONDING TO ITS COLOR WAVE. Not that the energy was disengaged as COLOR, but as ENERGY. COLOR BEING SIMPLY THE TRADE MARK OF NATURE, by which different wave lengths of energy may be recognized."

And, further, according to Cherry, the discovery of this theory "marked the dawn of a new era in the treatment of disease." In fact, he says:

> It was this discovery, we are told, that led into the development of treating disease by specific wave lengths of light—chromotherapy. It was also the source of inspiration which led me into research work which resulted in the development of our present "Neuropo System of Restoring Health."

But Cherry must have realized that it is hard to sell an abstract idea alone, for after a series of circumlocutions he finally got down to the business of adapting the theory to something salable. He did not believe, he said, in administering drugs, chemicals or serums, but he did advocate such things as "spinal adjustments and manipulations . . . with an alkaline bath once or twice a day followed by an external application of a proper alkaline protein preparation to the back, abdomen and chest to reduce acidosis and equalize the nerve potential . . ." He determined that his mixture must be something nonpoisonous, readily absorbable and noninterfering with bodily functions:

> In other words, I believed that I must produce a chemical compound with all of the wave length characteristics necessary to kill tubercle bacilli, and at the same time have it so harmless that one could take a bath in it several times daily, if so required, without any harmful results . . . and therefore it was evident to my reasoning that to cure tuberculosis and other diseases we must neutralize the acid condition or in other words alkalize the system. I therefore concluded that some form of alkaline protein or albuminoid compound would more correctly imitate nature in combating disease.

It might seem unthinkable to ordinary scientists to be able to crowd chromotherapy and wavelengths into a bottle that was already filled with "some form of alkaline protein or albuminoid compound"—but leave it to Cherry. Was he not a trained engineer? Here is part of his secret:

> Thus did I reason and work, trying this and that combination of chemicals and drugs—making spectographs of the various compounds, emulsions and colloidal combinations, comparing them with the picture of the spectrum of the tubercular culture, testing the different samples on my skin in order to study its effect, ability to penetrate or be absorbed, which tests were often followed by dumping the whole batch into the sewer to try something else . . . until I succeeded in getting a compound that would relieve my cough temporarily . . . just in time, as I was beginning to lose all hope of accomplishing anything worth while.

And, of course, there followed "an increase in pep and vitality" (familiar words!) which, however, was succeeded in turn by a temporary relapse. Perhaps he had not put in enough chromotherapy and wavelengths. This thought may also have occurred to Cherry, for, in spite of some subsequent improvement in his condition:

> I began again my experiments in modifying the remedy . . . About six weeks after I began treating myself, I had improved to such an extent that I suspected the remedy was improving my syphilitic condition and accordingly had a Wassermann test made. Although I had no idea at first that it would be effective in this disease, I found the test negative.

But Cherry had still more to contend with:

In addition to being afflicted with tuberculosis and syphilis . . . I found that I also had cancer of the sigmoid . . . and I naturally felt somewhat depressed by this added complication. The treatments I had been taking did not seem to be helping my cancer trouble . . . so I concluded to make a local application of the remedy diluted with warm water . . . applied as a high enema . . . followed by the application of an ointment made from the same ingredients as the remedy (except in different proportions) to which was added a little yellow iodid of mercury . . . cocoa butter and an oil. . . . These treatments were . . . supplemented with a diet of fruit juices, sauerkraut, vegetables, and very little meat.

After treating himself thus for a few days, Cherry says, he passed with stool "what appeared to be a tumorous growth consisting apparently of fibrous mucous tissue, mixed with pus and blood." Successive treatments "seemed to completely eradicate all symptoms of cancer and I have never been troubled with it since and 'Radionic' diagnosis shows zero reaction." [Some Abrams stuff.—ED.]

But Cherry is at his quaintest in summing up his experiences:

To bring the story of my fight for life to a close, one year after I first began treatment for tuberculosis, I was able to pass most known tests that science considers as more or less reliable (including the E. R. A. or electronic test) [Some more Abrams stuff.—Ed.] which found all diseases with which I had been afflicted were of negative indication.

The Q. E. D. of Cherry's thesis, therefore, is that for cancer, tuberculosis, and all the rest of the category, the answer is his Neuropo or Neuropo Ointment, or both. As supplementary treatments one may take Neuropo enemas, baths and douches. The name Neuropo, incidentally, he says, "is evolved from the Latin NEURO POTENS, signifying *nerve power,* which is unquestionably built up by its use . . ." Although Cherry advises the reader to "use Neuropo for all ailments" and goes on to name a long list of more or less serious conditions in which he recommends its use, he finally admits:

We do not claim to have discovered the *"Elixer of Life"* or the *"Fountain of Perpetual Youth"* . . . but we do believe that in our NEUROPO SYSTEM OF RESTORING HEALTH . . . we have possibly advanced our knowledge and understanding of the science of living to such an extent that others following . . . may make further contributions, to the end that we as a race shall be able to extend our lives many years, on and on,—even to the ultimate expectancy of "Everlasting Life"—HERE ON EARTH.

It is at least a beautiful thing to hope for,—a vision so resplendent with expectation and alluring in its scope that the much heralded picture of a future life beyond the grave seems to fade or dissolve into the possible "Reality" of prolonged joys of living HERE. With a brand new body every seven years, properly maintained and kept normally alkaline, one should never get to be in reality, over seven years of age according to the scientific view.

To those persons who have lived a long time but have never been "over seven years of age" Cherry's ideas should make an irresistible appeal!

But all was not to be smooth sailing for Cherry's venture in the sale of bottled wavelengths, chromotherapy and Neuropo. The Post Office Department, for one, became skeptical of his claims. It learned that his business was started in Kansas City but was moved to El Paso in February 1932. Though Cherry claimed that it was incorporated in Texas, he was unable to furnish the date of incorporation, and it appeared that he was the only person connected with the enterprise, as he operated it from his home and had no employees, it was said. He obtained business by sending out printed circulars, a booklet and specially prepared letters to those whose names he got in various ways. As he refused to give the Post Office inspectors the formulas for his several preparations, these products were purchased through the mails and analyzed by a government chemist, whose condensed reports follow:

NEUROPO: Ammonia, 18 per cent; potassium sulfate, iron and magnesium; volatile oils (including safrol); fatty (saponifiable) material; alkaloidal (?) material; proteins (claimed on label) present, but in very small amount; no mercury, salicylates, or iodides.

NEUROPO BATH LOTION: Ammonia, 18.7 per cent; potassium sulfate, with magnesium and iron; volatile oils (safrol and turpentine indicated); saponifiable fats and oils.

NEUROPO OINTMENT: Xylene; sodium carbonate, chloride and iodide; volatile oil (turpentine-like); fatty acids (calculated as oleic); saponifiable fats; mercury and iodine (probably as mercuric iodide in original); triethanolamine (an emulsifying agent) and gum indicated in small amounts; yellow fluorescent dye present; amount of protein (mentioned on label) insignificant.

NEUROPO ENEMA SOLUTION: Ammonia, less than 1 per cent; iron, magnesium, potassium and sulfates; volatile oils (such as turpentine); fatty oils; gum indicated in very small amount.

NEUROPO DOUCHE SOLUTION: Ammonia, less than 1 per cent; magnesium, potassium, sodium and sulfates; volatile oils (such as turpentine); fatty material; yellow dye with strong green fluorescence present; gum indicated in very small amount.

The Post Office memorandum on this case brought out that expert medical testimony showed the worthlessness and in some cases the actual harmfulness in using these nostrums for the conditions named.

In his written reply Cherry appears to have dodged the specific charges, but he claimed that in addition to his "medicine" business he was also engaged in some chemical research work of a nonmedical type which would be hampered if a fraud order was issued against the names he used in his nostrum business. As he did not, however, offer to discontinue making and selling his "patent medicines," and as his claims for them were found "grossly fraudulent," the Post Office issued a fraud order against the names Louis Bond Cherry, Louis Bond Cherry Office and Laboratories, Cherry Laboratories and Neuropo Products Company, on Aug. 10, 1939.

In that summer Cherry had also run into trouble from another direction. The El Paso *Herald-Post* for July 12, 1939, reported that Louis Bond Cherry had been found guilty of violating state laws in falsely labeling one of his products (in that article spelled "Neu-Ro-Pro") and fined $200 and costs in a local court. The report further stated that Cherry was facing trial on a second complaint, this one involving his ointment, but that the trial would be postponed pending outcome of his appeal on the first complaint.

So much for the spectacle of an individual who, after shifting from engineering to pseudomedicine sputtered feebly until put out by the Post Office Department.

MISBRANDED PRODUCTS

Abstracts of Notices of Judgment Issued by the Food and Drug Administration of the United States Department of Agriculture

[EDITORIAL NOTE.—These Notices of Judgment are issued under the Food, Drug and Cosmetic Act and in cases in which they refer to drugs and devices they are designated D. D. N. J., cosmetics C. N. J., and foods F. N. J. The abstracts that follow are given in the briefest possible form: (1) the name of the product; (2) the name of the manufacturer, shipper or consignee; (3) the composition; (4) the type of nostrum; (5) the reason for the charge of misbranding and (6) the date of issuance of the Notice of Judgment—which is considerably later than the date of the seizure of the product and somewhat later than the conclusion of the case by the Food and Drug Administration.]

Andree Eye Lash and Brow Colure.—Andree Laboratories, Coatesville, Pa. Composition included paraphenylenediamine. Declared potentially injurious if used as directed.—[*C. N. J., F. D. C. 11; May 1940.*]

Dark Eyes.—Dark Eyes, Chicago. Composition included ammoniated silver nitrate and pyrogallol. Eyelash and brow dye. Declared potentially injurious if used as directed.—[*C. N. J., F. D. C. 12; May 1940.*]

Hollywood Lash and Brow Dye.—Hollywood Lash Dye Co., Hollywood and Los Angeles. Composition included paraphenylenediamine. Declared potentially injurious if used as directed.—[*C. N. J., F. D. C. 7 and 8; May 1940.*]

Ideal Lash and Brow Dye.—George W. Eilert trading as the Ideal Lash & Brow Co., Los Angeles. Composition included paraphenylenediamine. Declared potentially injurious if used as directed.—[*C. N. J., F. D. C. 10; May 1940.*]

Lash Lure.—Lash Lure Cosmetic Manufacturing Co. or Cosmetic Manufacturing Co., Los Angeles. Composition included paraphenylenediamine. Eyelash and brow dye. Declared potentially injurious if used as directed. —[*C. N. J., F. D. C. 1 and 2; May 1940.*]

Mary Luckie Improved Lash and Brow Dye.—Mary Luckie, Inc. (No address given.) Composition included paraphenylenediamine. Declared potentially injurious if used as directed.—[*C. N. J., F. D. C. 9; May 1940.*]

Miller's Anti-Mole.—Miller Manufacturing Co., Lincoln, Neb. Composition included nitric and acetic acids. For removing warts and moles. Declared potentially injurious if used as directed.—[*C. N. J., F. D. C. 18 and D. D. N. J., F. D. C. 71; May 1940.*]

Palmer's Antiseptic Skin Lotion.—Solon Palmer, New York. Contained corrosive sublimate. For eczema, pimples, dandruff and itching, scaly eruptions. Declared potentially injurious if used as directed.—[*C. N. J., F. D. C. 21 and D. D. N. J., F. D. C. 68; May 1940.*]

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

HEAT SENSITIVENESS

To the Editor:—**For the past year a youth aged 19 years has developed giant urticaria following sweating after physical exertion. The wheals appear first around the belt line and then may develop on any part of the body. They grow to enormous size and thickness and usually disappear within twenty-four hours. Epinephrine seems to affect them but little. His health is excellent. What are the possible causes of this condition and the treatment?**

M.D., California.

ANSWER.—Occasionally patients possessing thermic or heat sensitiveness may have reactions in the form of urticaria produced by increases of temperature which are sometimes of slight degree and produced by mental or physical effort; this type is called urticaria calorica to distinguish it from the urticaria of contact reactions. Symptoms of itching of the skin with or without wheal formation occur in such cases particularly when the body temperature is subnormal; they can be prevented by the application of cold.

Treatment is at times even more difficult than diagnosis. The mild case is often relieved by simply avoiding those situations which have been found productive of symptoms. For those who react either to heat or to cold, Duke has found that therapeutic alternation of the extremes of temperature may increase tolerance to a high degree. For example, treatment is begun with a hot water bottle or small bulb at some distance and, as soon as the patient reacts, cold is applied. When symptoms are relieved, heat is again applied. This is alternated several times at each treatment. The degree and duration of heat exposure are gradually increased until the patient can tolerate, if possible, prolonged exposure to the heat of a 1,500 watt lamp.

Caven used diathermy with elevation of temperature to 104 F. biweekly with good results. Temperature raising substances, e. g. colon or typhoid vaccine, are used. The use of epinephrine has been disappointing.

RECOVERY FROM TROPICAL DISEASES

To the Editor:—**If a man has contracted malaria, amebiasis, schistosomiasis, filariasis, kala azar or hookworm disease in a tropical country and leaves that country permanently and returns to a cool nontropical country so that he has no opportunity for reinfection or reinfestation, how long will it take for the disease to die out with and without treatment? I have consulted textbooks on parasitology and helminthology and have been unable to find this information.**

M.D., New York.

ANSWER.—Untreated patients with malarial infections have been known to harbor the parasites for several years in localities where there is no opportunity for reinfection. The length of time the infection will last is probably determined by the age, race and resistance of the patient, and the virulence and species of parasite involved. Therefore it would be impossible to determine in advance just how long any patient would retain his infection. With proper treatment many such patients are completely cured, but it must be remembered that even prolonged treatment by any of the antimalarial drugs now known may in some cases succeed only in keeping down clinical attacks without eliminating the parasites. It is not uncommon for patients to show relapses at varying periods of time following even intensive antimalarial therapeusis.

Patients having active amebiasis may become carriers, may pass into the chronic state or may become spontaneously cured. Again, as in the case of malaria, many variables are involved which are not yet well understood. It is not infrequent to encounter examples of chronic amebic dysentery which have persisted for twenty years. Modern treatment greatly improves the chances for complete cure, but again it should be pointed out that treatment may bring about a disappearance of symptoms without effecting a complete cure.

Schistosome worms are long lived in the human patient. Even mild infections may last ten years, and infections of thirteen years' duration are known. Spontaneous cures are rare except in cases in which the number of worms is small. Intensive treatment is necessary to effect a cure. The efficacy of the drugs most commonly used depends on their ability to prevent egg production in the female worm. This may be effected temporarily in some cases, with a return of normal egg production when the treatment has been discontinued too soon. Although there are no definite data on the longevity of adult filaria, it is known that they can live a long time in man. The worms require a year to reach maturity, so it is reasonable to believe that they live several years. No effective treatment is known.

A high percentage (from 90 to 95) of untreated cases of kala azar terminate fatally. The duration is variable, from a few months for acute cases to two or three years for chronic cases. Patients have been known to retain the infection for five years. Treatment is now so satisfactory that the great majority of patients are cured. However, relapses following treatment are not unknown.

Hookworms can live for as long as from four to eight years in the intestine of man. However, studies on prisoners who were not subjected to reinfection have shown that a large number of the worms are lost in from six months to a year. Since hookworm treatment usually does not remove all the worms, the latter may persist for some time after treatment with the best available drugs. However, since they cannot multiply in man, a complete cure can usually be obtained by repeated treatments.

PLANTAIN, HOUSE DUST AND BACTERIAL ALLERGY

To the Editor:—**A young woman presented herself during the grass pollen season for treatment because of violent coughing spells, which had existed since January 1940 following an attack of influenza and sinusitis. There is a history of cough during the preceding summer, which apparently began and ceased with the onset and cessation of the grass season. The pulmonary examination is essentially negative. The sinuses are clearing up under treatment. X-ray examination reveals thickening of the mucous membrane of the sinuses. Cutaneous tests give a 3 plus reaction to house dust 1: 1,000 and to plantain 1: 1,000. A vaccine made from the purulent nasal discharge doesn't give a local skin reaction but gave a slight systemic reaction such as sneezing and stuffiness of the nose and aggravated the cough for about thirty minutes. Would it be advisable to give the house dust and plantain and vaccine subcutaneously now? How could one proceed to use these materials so that, should an unfavorable reaction occur, one would know which one was the causative factor? The positive food allergens have been eliminated. In a case of this sort would there be any objection to using displacement therapy with 0.25 per cent ephedrine sulfate solution for treatment of the infected ethmoids?**

M.D., Pennsylvania.

ANSWER.—The impression gained is that the patient's symptoms may be the result of a combination of extrinsic allergy and bacterial infection, and possibly allergy to the bacteria. When the inquirer speaks of the grass season it is presumed that he is referring to the plantain season, since no mention is made of positive reactions to grass pollens. There is no clearcut clinical evidence for house dust allergy, although the possibility of the presence of the latter has not been disproved. The systemic reactions from the vaccine injections speak strongly in favor of an allergy to these bacteria. Considering the facts presented, it would seem advisable to treat the patient with subcutaneous injections of all three materials: plantain pollen extract, house dust extract and the bacterial vaccine. Ordinarily all three antigens can be administered at one visit. However, if constitutional reactions tend to repeat, it may be necessary to give each material on a separate visit in order to locate the particular one responsible for the reaction. In most instances also the antigen responsible for constitutional symptoms is the one giving the most marked local reaction. There is no particular objection to the use of ephedrine displacement therapy, although simple vacuum aspiration may be just as effective.

TREATMENT OF PARKINSON'S DISEASE

To the Editor:—**Will you please let me know the latest treatment for paralysis agitans and whether vitamin B is of special value.**

T. J. Jensen, M.D., Duluth, Minn.

ANSWER.—With regard to the treatment of Parkinson's disease or true paralysis agitans, Oppenheim remarked "In this disease the physician can do much harm and little good." Since the actual cause is unknown, any treatment is of necessity purely symptomatic. That the lesion is a degenerative one associated with cerebral vascular sclerosis involving the lenticular nucleus and its related structures is well founded at this time. Some of the symptoms may be alleviated by carrying out passive movements by giving tepid baths or by the use of mild vibration massage. Scopolamine hydrobromide in doses of from $\frac{1}{150}$ to $\frac{1}{100}$ grain (0.0004 to 0.00065 Gm.) three or four times daily by mouth may be used. Powdered stramonium leaves in doses of from $1\frac{1}{2}$ to 2 grains (0.1 to 0.13 Gm.) three or four times daily. The tincture of stramonium may be given in doses of from 15 to 60 drops three times a day. The increase in dosage of

the tincture can be accomplished by adding 5 drops every week until 60 drops is taken three times daily. A tincture of belladonna has also been reported as of value. All these drugs may produce a reaction of overdosage. This is realized by an excessive dryness of the mouth, dilatation of the pupils and its associated decrease of visual accommodation and a mild delirium. When this occurs the patient should be taken off the medication for a time or the dose must be decreased. The patient should not be excited and should be in as quiet surroundings as is possible. Strenuous kinds of entertainment should be discouraged. Otherwise he should lead an active life and work if possible. Cold water treatments, exercises, sun baths, vigorous massage and faradization are all contraindicated. Vitamin B_6 has been reported favorably by some investigators.

ERUPTION OF INFANTS' TEETH, FEVER AND LANCING

To the Editor:—**In the town I am practicing in it seems to be the rule to "lance babies' teeth" for all fevers and other disturbances that may bother the infant. In all the pediatrics I have had I cannot recall this teaching. As a matter of fact, recollection causes me to believe that it is a technic held in disrepute. I wish to get expert opinion on this subject to satisfy my lack of knowledge on it.**

Alex J. Otten, M.D., McCloud, Calif.

ANSWER.—In years past the practice of lancing the mucous membrane over erupting teeth of infants or rubbing the teeth through with a smooth hard surface object was far more common than present opinion believes warranted. Yet there are times when the procedure may be used to advantage.

Rarely if ever can the cutting of a tooth be considered a direct cause of fever. The discomfort may make a fretful baby. This in turn may interfere with both rest and feeding, which may lower resistance and predispose infection. Increased salivation during teething may affect digestion.

It sometimes happens that the soft tissue of the mucous membrane offers greater than usual resistance to the erupting tooth. In such instances the prolonged period of irritation may indirectly contribute to fever or digestive disturbances. Under circumstances of this sort either lancing the gum or rubbing the tooth through is justified and in these occasional instances will be found to contribute materially to the comfort of the baby and the consequent peace of mind of the entire household.

TOXICITY OF STODDARD SOLVENT

To the Editor:—**A patient working in a locomotive repair shop complains of pains in the arms and hands and irritation of the eyes. The symptoms complained of indicate a neuritis. He has been using a preparation called Stoddard solvent, made by the Waverly Oil Company, and is under the impression that this compound is responsible for the symptoms. Any information that you can give me as to the toxicity of this material will be appreciated.**

J. P. Hobson, M.D., Springboro, Pa.

ANSWER.—Stoddard solvent is a petroleum distillate having a flash point of not less than 100 F. Its distillation range is such that not less than 50 per cent is recovered in the container with a thermometer at 350 F. with a distillation end point not higher than 410 F. This solvent thus has such properties that explosions and fire hazards are much lowered over petroleum spirits, which have a flash point of 70 F. This substance was formulated for chief use in the dry cleaning industry, but many other lesser applications have developed, such as for metal cleaning. Owing to its low power of evaporation, this substance is regarded as less toxic than petroleum naphtha, gasoline, petroleum spirits, volatile mineral spirits and the like. Similarly, it is regarded as less of a skin irritant or skin fat solvent, since its boiling range is nearer that of petroleum light lubricating oils. Assuming that evaporation may take place and that damage to exposed workers may arise, the clinical picture is likely to conform to that of petroleum distillates in general. All such substances are reported as capable of producing a typical picture associated with some or all of the following objective observations: Loss of weight, tachycardia, secondary anemia, skin irritation, gastrointestinal irritation, mental depression, muscular twitchings, tremors and the like.

It is believed that the irritation of the eyes mentioned possibly may be attributed to the vapors of Stoddard solvent, but the occurrence of a neuritis with pains in the arms and hands appears improbable. For information on specifications and chemical attributes, reference is made to "Stoddard Solvent," a Department of Commerce Report (Commercial Standard CS3-28), Government Printing Office, Washington, D. C., 1929. For clinical data, see "Poisoning by Petrolatum Distillates," by E. R. Hayhurst, *Industrial Medicine* **5**:53 (Feb.) 1936.

INFLAMMATION OF SPHENOIDAL SINUS

To the Editor:—**A white woman aged 33, a school teacher, for the past five years has been suffering with severe retrobulbar pain, diplopia, dizziness, pain in the occipital region, dimmed vision (and at times it is blurred) and unsteady gait due to the diplopia during an attack. She is physically well nourished, mentally alert and there is nothing of significance except a papilledema of the right eye persisting for five years and some atrophy of the nerve. All reflexes are present. She has been carefully examined except for an encephalogram and seen by one of our best local neurologists and discharged from the New York Neurological Institute with the diagnosis chronic encephalitis. The past history of this patient is interesting. She had an appendectomy one week after marriage, has no sexual desires, and complained of abdominal pain for six months following the operation. Brain tumor was ruled out. An otolaryngologist made a diagnosis of ethmoiditis. Other impressions were multiple sclerosis. My impression is a neurosis or a vitamin deficiency. I have been seeing the patient for about one month and have been giving her intravenous thiamine hydrochloride from 15,000 to 30,000 units every third day and short wave therapy to the frontal sinuses. She has received much relief and then over this past week end had an acute exacerbation of her syndrome. Could you suggest anything in the way of treatment or diagnosis?**

M.D., New York.

ANSWER.—A neurosis will not cause a papilledema or an atrophy of the optic nerve. One sided papilledema and contralateral atrophy are extremely suggestive of the Foster Kennedy syndrome due to inflammation of the sphenoidal sinus. Multiple sclerosis is not probable in the presence of a papilledema but must be ruled out by continued neurologic observation. Vitamin deficiency is pretty much out of the question as an etiologic factor.

In view of lack of specific diagnosis, it is suggested that nonspecific, shock-producing foreign protein therapy might be of value.

TETANY AND POSSIBLE SPRUE

To the Editor:—**A man with nontropical sprue lost considerable weight and also developed tetany, having had diarrhea for three years. The tetany was not controlled by calcium lactate, and calcium had to be given intravenously daily. However, since switching to calcium chloride the tetany has been under control. His sprue has improved somewhat following liver therapy and low fat diet, and his weight has picked up although he is still far from normal. I have been unable to get vitamin D into him, and he still finds it necessary after a year and a half to take calcium chloride. Have you any suggestions as to how I can (1) get vitamin A and vitamin D into this patient, (2) increase his weight and (3) eliminate the constant taking of calcium? Will he ever be cured of sprue or must he take liver for the rest of his life?**

Walter J. Farr, M.D., Teaneck, N. J.

ANSWER.—One would seriously question the diagnosis in this case. Certainly more data are necessary on the entire condition of the patient, including the results of a course of parathyroid extract hypodermically. The thyroid status and basal metabolic rate would need to be known. It would be necessary to determine the acid-base equilibrium of the blood, as tetany may arise either from deficiency of calcium with normal alkalinity or from a normal calcium level with excessive alkalinity. One would like to know whether hyperventilation is present with its attendant increase of alkalinity, in which case one would consider the administration of diluted hydrochloric acid solution or ammonium chloride. If the tetany is due simply to deficiency of vitamin D, the use of a sun lamp or direct sunlight, together with administration of vitamin D, would be indicated. If the tetany is due to deficient quantity or function of parathyroid tissue, it would be necessary to give parathyroid extract. The proper use of parathyroid extract, acids, viosterol in oil, sunlight and calcium salts intravenously covers the therapy in these particulars. X-ray studies of the bones should be made to determine the degree or presence of osteoporosis.

If the fault is with enteric absorption, it would be worth while trying the effect of thyroid extract and purified bile salts combined with a careful diet. This diet should approximate Fairley's ratio of protein 1.0, fat 0.3 and carbohydrate 1.3, with a gradual increase to the formula protein 1.0, fat 0.36, carbohydrate 2.0. Liver extract may be tried in large doses parenterally, 10 cc. in the muscle daily for from twenty to thirty days. Sometimes this can be supplanted or increased by liver extract in powder form by mouth, 4 Gm. three times a day with meals.

With regard to the numbered questions: 1. Vitamin A can be given intramuscularly, in the form of carotene (provitamin A) in aqueous suspension. (A preparation of this kind is marketed by the S. M. A. Corp.). It would seem best to rely on ultraviolet therapy for providing a vitamin D effect.

2. Increase of available fat will follow proper intestinal absorption. The Althausen galactose tolerance curve should be secured in order to estimate the absorptive power from the small intestine.

3. Nontropical sprue is characteristically resistant to treatment, and the prognosis must of necessity be guarded.

BLINDNESS FROM HEMORRHAGE INTO OPTIC NERVE CANAL

To the Editor:—I should be grateful for any information concerning the etiology of blindness and the prognosis for return of vision in the following case history: The patient was struck over the left temple by a mounted pair of antlers. They fell perhaps 12 inches from the wall. She was momentarily unconscious but subsequently, except for moderate pain, headache and the rapid development of a large ecchymosis about the left orbit, all right. As soon as the excitement incident to the injury subsided (within a few minutes) the patient noticed that she could not see out of the left eye. I saw her for the first time some two weeks after the injury. At examination there was a minor abrasion beneath the left orbit and a large discolored ecchymosis about the left orbit. The temporal side of the left sclera was lightly stained with yellowish (blood) pigment. Ocular movements were normal. The cornea, aqueous, iris and pupil appeared normal. Subjectively the patient was completely blind in the left eye. Objectively there was no reflex to light in the injured eye, nor did the right (normal) eye give a consensual reflex to light shined into the left eye. However, variations in the intensity of light shined into the right (normal) eye resulted in consensual changes in the left (blind) pupil. The left pupil dilated evenly under atropine. Ophthalmoscopically the lens and vitreous were clear. The disk and retina appeared normal, with no creases or folds of the retina. The arteries and veins appeared normal. The nerve head and retina were of normal color (as far as a backwoodsman without special training could tell). Two months after injury there is still no light perception in the left eye and examination is essentially the same except that (1) ecchymosis about the orbit and discoloration of the sclera are cleared and (2) the nerve head is perhaps pale. (This last observation is questionable.) No roentgenogram of the orbit has been taken and no treatment prescribed. What additional examination and therapy, if any, should be undertaken?

M.D., Montana.

ANSWER.—The loss of sight was probably due to hemorrhage within the sheaths of the optic nerve, in all likelihood within the optic canal. This may have been due to a fracture of the orbit which could be detected even this late by careful x-ray examination. Immediate pressure by the blood within the nerve sheaths on the fibers of the optic nerve caused the immediate loss of sight. Absorption from this area is slow and consequently the pressure was maintained sufficiently long to cause a pressure atrophy of the nerve fibers. About six weeks is required before such atrophy becomes visible ophthalmoscopically in the form of so-called primary pallor of the disk. Had the condition been diagnosed at once, immediate radical opening of the orbit with drainage windows in the sheaths of the nerve (Elschnig-Mueller operation) might have resulted in complete restoration of vision; but now there is nothing that can be done and there is no possibility of restoring the vision.

REFRIGERATION NOT INDICATED FOR CHRONIC ALCOHOLISM

To the Editor:—Because I can find no reference at all to the treatment of chronic alcoholism by the new "refrigeration method," I am writing to ask if there is anything at all to it. I am entirely ignorant of its possibilities and feel sure that there is nothing to it. The wife of a chronic alcoholic addict tells me that she has both read in the newspapers and been told of the method being used with success. I wish to feel more secure before discouraging her more completely about it. Any information will be appreciated.

M.D., Connecticut.

ANSWER.—No instance in which refrigeration has been used for chronic alcoholism has been found. Prompt and impressive relief of pain which follows refrigeration has, however, been observed. It has been possible to remove patients from dependence on narcotics following refrigeration and this has led to the observation of the effect of refrigeration and its method on narcotic addiction in a few instances. Refrigeration does not appear to be applicable to the problem concerned with chronic alcoholism, as refrigeration favors cerebral edema, which is an undesirable complication of chronic alcoholism. Its use, therefore, might be expected to be highly detrimental rather than beneficial.

ASPHYXIAL DEATH

To the Editor:—I wish to know the postmortem picture that one would expect to find in a baby about 3 months old that smothered to death lying on its face. Would there be any characteristic blood abnormalities? Can you tell me where I can find the answers to these questions or answer them?

M.D., Indiana.

ANSWER.—In most instances, though not invariably, one would expect to find unusually dark patches of postmortem lividity on the body surfaces, particularly those toward which the blood would normally gravitate. The lips, mucous membranes of the mouth, the nose, ears and finger and toe nails are of a purplish hue. There are no marks of localized violence on the face and neck other than might be expected from the nature of the material on which the body was lying.

Internal organs show uniform congestion and engorgement with dark colored blood. The vascular system is engorged, particularly the veins and the right side of the heart, which is distended. The left side of the heart is usually contracted. As in all asphyxial deaths, the blood remains fluid longer than usual. There are small subendothelial petechiae found on the serous surfaces of the lungs, heart and other organs.

The blood chemistry is of no significance unless the specimen is taken immediately after death. In that event one would find a definite decrease in carbon dioxide combining power and in the oxygen content of arterial blood. Even in nonasphyxial cases these values diminish at a rapid rate after death has occurred.

COLONIC IRRIGATION

To the Editor:—What is the opinion on the colonic irrigating apparatus now used in some cases of colonic and gastric disturbances? I have seen a demonstration with the colonic irrigator but hesitate to approve it until I receive further discussion on this subject.

Richard A. Nagle, M.D., Chicago.

ANSWER.—It is extremely difficult to determine the field of usefulness, if any, of colonic irrigation. While the role of the small cleansing enema and of the medicated retention enema seems well established, colonic lavage has been outrageously exploited in many quarters. There is little evidence to show that it may benefit diseases of the colon and there is none for the stomach. On the other hand, it may cause harm.

No complicated or costly chromium plated equipment is needed or advised. A simple soft rubber tube and glass jar prove adequate.

Before purchasing equipment the writer is advised to read the authorized report on this subject by Dr. Frank H. Krusen of the Mayo Clinic to the American Medical Association Council on Physical Therapy (THE JOURNAL, Jan. 11, 1936, p. 118).

LEAD HAZARD FROM COMMON CONTACTS

To the Editor:—One of the consumers' groups has come into prominence by charging the presence of lead in dangerous quantities in common contacts. These are notably fumes from automobile exhausts in traffic, and foods, particularly chocolate (including the most reputable American brands), and dried fruits, like prunes. Have you any data as to the accuracy of this information?

M.D., Maine.

ANSWER.—It is difficult to answer this query because no mention is made of amounts of lead. Food and Drug officials have set a standard for the amount of lead allowed in foods and have been active in enforcing this requirement. This so-called tolerance is safe, since lead taken in by mouth is much less hazardous than when inhaled as fumes or dust. In the analysis of bones, Barth (*Virchows Arch. f. path. Anat.* **281**:146, 1931) found little evidence of accumulation of lead in bones during life. This is the crux of the problem, for if lead is not ingested in sufficient quantity to be stored in bone it is highly unlikely to produce poisoning. The same thing may be said of automobile exhausts in traffic. When lead was first introduced into gasoline there was considerable discussion as to whether many people would not get lead intoxication. No cases of lead poisoning among the general public from this source have developed, so far as known, even in large cities. Some lead may appear in foods which are packaged in lead foil, but tin or aluminum foil is more generally used.

DERMATITIS FROM FORMALDEHYDE

To the Editor:—A patient has been doing comparative anatomy and thereby handling formaldehyde daily for a period of five and one-half months. About two or three months ago she contracted and has continued to have vesicular dermatitis of the hands and edema of both legs. The swelling in the legs goes down at night. An examination reveals no tumor growth. Her blood and urine are normal. She is apparently perfectly well. I know that formaldehyde can provoke arterial necrosis. Could it be a cause of the edema in her legs? It is not Milroy's disease.

William J. MacDonald, M.D., Boston.

ANSWER.—The vesicular dermatitis of the hands of this patient may be caused by the formaldehyde which she handles. Formaldehyde, when used for long periods in concentrations of from 2 to 10 per cent, can set up eczematous lesions of the skin characterized by vesicles and ulcerations. More concentrated solutions may actually cause burns and necrosis of the skin.

The edema of the patient's legs is not caused by exposure to formaldehyde. Nowhere in the literature can there be found such an effect of long exposure to formaldehyde. Irritation of the skin, of the nails and of the mucous membranes of the respiratory tract and of the conjunctivas are the principal toxic effects of exposure to formaldehyde. In rare cases there may occur irritation of the gastrointestinal tract accompanied by

nervous excitement. The fact that the urine is normal indicates that the kidneys are not being irritated.

The edema of the legs may be due to cardiac disease unrelated to exposure to formaldehyde or to mechanical constriction, such as garters, or to accumulated fecal matter pressing on the large veins of the pelvis, or even to a retroverted uterus acting in the same way.

If the dermatitis is due to formaldehyde, the application of a soothing ointment or lotion, and the wearing of rubber gloves while working so as to prevent further contact with the chemical, will relieve the condition.

ESCHAROTIC PASTES AND CANCER

To the Editor:—A patient was treated elsewhere for carcinoma of the lower lip by the application of a paste. She was in severe pain and after some inquiry I found that the paste consisted of zinc chloride, sanguinaria and wheat flour, each in equal parts. Three questions arose in my mind concerning this treatment. 1. Is this approximately the same formula that is used in many of the so-called cancer sanatoriums? 2. Is the efficiency of it enough to warrant its use in any case whatever? 3. What are the dangers and complications which might arise from the use of such treatment?

E. E. Gamet, M.D., Lamoni, Iowa.

ANSWER.—1. Zinc chloride is the essential constituent of most of the pastes used in "cancer sanatoriums." The other ingredients undoubtedly vary.

2. Escharotic paste is not indicated in the treatment of any form of cancer. Surgery, radium and x-rays are the accepted methods for the treatment of these lesions.

3. One of the main difficulties connected with the escharotic treatment of cancer lies in the inability to control the treatment. If too little is used, the local or primary growth may not be entirely removed. A second and more important difficulty is the inability to treat the regional lymph nodes.

DYSTROPHIA OF CORNEA

To the Editor:—I should like to have some information concerning a peculiar corneal lesion. A woman about 55 years old has normal vision and does not remember even a minor injury. She states that about one year ago she noticed a yellowish white speck on the cornea, about 4 mm. central to the limbus. No treatment was instituted. During the past month or two the mass has enlarged a little, so that now it resembles a 1 by 2 mm. yellowish white, elevated and umbilical lesion. The edges are sharply defined and there appears a faint infiltration in the substantia propria of the cornea. I should like to have your comments on the diagnosis and suggested treatment.

M.D., Michigan.

ANSWER.—It is difficult to give a specific answer as to what type of lesion is affecting the cornea without actually seeing the eye and watching the progress of the condition. The lesion might be included in any one of the many types of dystrophia of the cornea of which little is known as to cause or treatment. A neurogenic basis might also be considered. In addition it is possible that an unknown injury might have caused an infection to occur in the cornea. A test of the corneal sensitivity might give a lead as to the etiologic factor. Another source which must be thought of is a lesion due to yeast, molds and the like. Closely related to the dystrophia of the cornea are such types of degenerations of the cornea and this must also be considered. Treatment in any case must necessarily be guided by the causative factor; however, the prognosis is not good.

ABDOMINAL PAIN AFTER NEPHRECTOMY

To the Editor:—Three years ago I removed a badly infected and enlarged right kidney from a white woman aged 23. Until the past three months she has been enjoying excellent health. Now she has attacks of severe sudden pain in the lower right quadrant of the abdomen requiring morphine for relief. A pelvic examination is essentially negative, as is a urine analysis. On cystoscopy there is nothing abnormal found. I am able to pass a No. 7 urethral catheter up 20 cm. on the right side. At the time of operation I was able to get only a strip of ureter out with the kidney, for the patient's condition was bad. I now ask Is her pain due to spasm of the remaining piece of ureter on the right side? What should be done in this case? Should the right ureteral orifice be destroyed by the electric current?

M.D., Ohio.

ANSWER.—The ureter remaining following nephrectomy is seldom the cause of abdominal pain. In the rare case in which it occurs, the pain is caused either by stone in the lower end of the ureter or by reflux of urine from the bladder, the ureter acting as a diverticulum.

A plain roentgenogram, and the fact that it is possible to pass a No. 7 catheter to a distance of 20 cm. in the remaining portion of the ureter, should exclude the possibility of stone. A ureterogram would show a dilated ureter if reflux of urine from the bladder is sufficient to cause pain.

In all probability the pain is of extra-ureteral origin.

NASAL VAPOR IN WARM AIR

To the Editor:—A man aged 24 and apparently in good health (except for heavy brown furring or coating of tongue, especially in the midportion and toward the posterior part) complained that he and his mother noticed "a sniffing of a vapor from his nose which looked just like condensed moisture in breath only the atmosphere was not cold at the time." This has happened four times in two years. By repeated exhalations through the nostrils this vapor appeared. It has occurred on arising and also two occasions after eating breakfast. Can you suggest any cause for such a phenomenon? I feel that scientific importance cannot be attached to it.

M.D., Kentucky.

ANSWER.—The phenomenon described is indeed strange. There might be several explanations for the condition; each would probably be on a physical basis. There is no reason why it should be a sign connected with a disease process or some physiologic change.

Although it was not cold at the time when the vapor was seen, the patient may have been sitting in the rays of direct sunlight, which would accentuate the moisture in the exhaled air. The nasal passages should be carefully examined to see whether a spur or a peculiarly shaped turbinate has not been the cause of vapor formation when the exhaled air passed over its moist surface. Nasal instillations of oil could also be vaporized in the same way.

The brown coating of the tongue would not seem to be connected with this condition.

DANGER FROM RABIES IN DEAD ANIMALS

To the Editor:—Is there any possibility of infection with rabies from touching any tissues from a dead rabid animal which may be about the streets? If there is that danger, for what period of time from the death of the animal will the virus live under ordinary city street conditions?

Murray Greenwald, M.D., Brooklyn.

ANSWER.—So far as known it would not be possible for the infection in rabies to pass through the healthy human skin on touching a dead rabid animal. The possibility of infection through abrasions and wounds of the skin cannot be denied. No definite statement can be made as to how long the virus of rabies can live in a dead animal under ordinary city street or other conditions.

BIRTH PARALYSIS AND WHEAT GERM OIL

To the Editor:—A little boy has spastic paralysis due to a possible birth injury. Please advise the technic and virtues of germ wheat oil treatment.

M.D., Florida.

ANSWER.—The wheat germ oil treatment has been suggested only for cases of muscular dystrophy and of amyotrophic lateral sclerosis presumably due to deficiency of vitamin E. Even in these conditions its value is questionable. It would certainly not be effective against the results of birth injuries.

LIMESTONE DUST AND PNEUMOCONIOSIS

To the Editor:—Would you please give me some information regarding a case of pneumoconiosis caused from the inhalation of dust that does not contain silicates but is caused from limestone gravel dust, which has persisted for more than two years without much evidence of improvement. What would be the chances for an ultimate recovery?

J. O. McKenney, M.D., Beaver Dam, Ky.

ANSWER.—Relatively pure limestone dust does not produce serious reactions in the lungs, as indicated by the observations in large numbers of cement plant employees. The statement that a pneumoconiosis from this source "has persisted for more than two years without much evidence of improvement" needs amplification. If there are changes of significant nature, they must have been produced by some other cause. If the manifestation of these changes is limited to exaggeration of the normal pulmonary markings in a chest roentgenogram, such changes will probably persist; but they are of little or no clinical significance.

POSTURAL HYPOTENSION

To the Editor:—In Queries and Minor Notes for June 15, 1940, page 2404, there appeared an inquiry from a physician concerning a patient whose chief complaints were extreme weakness and dizziness on assuming the upright posture. The description fits in well with the diagnosis of postural or orthostatic hypotension, a symptom complex first described by Bradbury and Eggleston (*Am. Heart J.* 1:73 [Oct.] 1925); since then a number of cases have been reported and it has come to be a well defined clinical syndrome. The characteristic feature of orthostatic hypotension is the marked fall in the systolic and diastolic blood pressures on assumption of the sitting or standing posture. The diagnosis is easily confirmed by blood pressure readings in the prone and erect positions.

J. W. Welty, M.D., Philadelphia.

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, July 27, page 323.

BOARDS OF MEDICAL EXAMINERS

ALASKA: Juneau, Sept. 3. Sec., Dr. W. W. Council, Box 561, Juneau.

ARKANSAS: *Regular.* Little Rock, Nov. 7-8. Sec., Dr. D. L. Owens, Harrison. *Eclectic.* Little Rock, Nov. 7. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco, Oct. 2. *Written examination.* Sacramento, Oct. 21-24. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

DISTRICT OF COLUMBIA, Washington, Nov. 11-12. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Tampa, Nov. 18-19. Sec., Dr. W. M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, Oct. 8-9. Joint-Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IDAHO: Boise, Oct. 1. Dir., Bureau of Occupational License, Mr. H. B. Whittlesey, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Oct. 1-3. Superintendent of Registration, Mr. Lucien A. File, Springfield.

KANSAS: Topeka, Dec. 10-11. Sec., Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, Dec. 3-5. Sec., State Board of Health, Dr. A. T. McCormack, 620 Third St., Louisville.

MARYLAND: *Medical.* Baltimore, Dec. 10-13. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 10-11. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: Lansing, Oct. 9-11. Sec., Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MINNESOTA: Minneapolis, Oct. 15-17. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: *Reciprocity.* Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: *Reciprocity.* Helena, Sept. 30. *Written.* Helena, Oct. 1-2. Sec., Dr. S. A. Cooney, 216 Power Block, Helena.

NEVADA: *Reciprocity with oral examination.* Aug. 5. Sec., Dr. Fred M. Anderson, 215 N. Carson St., Carson City.

NEW JERSEY: Trenton, Oct. 15-16. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 7-8. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 23-26. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Building, Albany.

OKLAHOMA: Oklahoma City, Dec. 11. Sec., Dr. James D. Osborn Jr., Frederick.

PUERTO RICO: San Juan, Sept. 3. Sec., Dr. O. Costa Mandry, Box 3854, Santurce.

VERMONT: Burlington, Feb. 11. Sec., Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 4-6. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WEST VIRGINIA: Morgantown, Oct. 31-Nov. 2. Sec., Public Health Council, Dr. Arthur E. McClue, State Capitol, Charleston.

WISCONSIN: Madison, Jan. 14-17. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

WYOMING: Cheyenne, October. Sec., Dr. M. C. Keith, Capitol Building, Cheyenne.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, Sept. 17. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

CONNECTICUT: New Haven, Oct. 12. Chairman, State Board of Healing Arts, Dr. Charles M. Bakewell, 1945 Yale Station, New Haven.

DISTRICT OF COLUMBIA: Washington, Oct. 21-22. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Gainesville, Nov. 1. Applications must be on file not later than Sept. 16. Sec., Dr. John F. Conn, John B. Stetson University, De Land.

MINNESOTA: Minneapolis, Oct. 1-2. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA: Lincoln, Oct. 1-2. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

OREGON: Portland, Oct. 26. Sec., Mr. Charles D. Bryne, State Board of Higher Education, University of Oregon, Eugene.

SOUTH DAKOTA: *Examination.* Yankton, Dec. 6-7. *Endorsement.* Dec. 21. Sec., Dr. Gregg M. Evans, Yankton.

WISCONSIN: Madison, Sept. 21. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

Montana April Report

Dr. S. A. Cooney, secretary, Montana State Board of Medical Examiners, reports the written examination held at Helena, April 2-3, 1940. The examination covered ten subjects. An average of 75 per cent was required to pass. Five candidates were examined, all of whom passed. Eight physicians were licensed by reciprocity and one physician was licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Loyola University School of Medicine		(1940)*	81.1
Northwestern University Medical School		(1936) 83.4, (1940)†	76.6
Rush Medical College		(1939)	81.7
University of Minnesota Medical School		(1940)‡	83.8
School	**LICENSED BY RECIPROCITY**	**Year Grad.**	**Reciprocity with**
University of California Medical School		(1936)	California
Rush Medical College		(1938)	Colorado
University of Minnesota Medical School		(1938, 2)	Minnesota
St. Louis University School of Medicine		(1939)	Missouri
University of Nebraska College of Medicine		(1931), (1935)	Nebraska
Queen's University Faculty of Medicine		(1927)	Michigan
School	**LICENSED BY ENDORSEMENT**	**Year Grad.**	**Endorsement of**
College of Medical Evangelists		(1938)	N. B. M. Ex.

* This applicant has completed four years' medical work and will receive the M.D. degree on completion of internship. License has not been issued.

† This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship. License has not been issued.

‡ License has not been issued.

Arizona April Report

Dr. J. H. Patterson, secretary, Arizona State Board of Medical Examiners, reports the written examination held at Phoenix, April 3-4, 1940. The examination covered ten subjects and included 100 questions. An average of 75 per cent was required to pass. Four candidates were examined, all of whom passed. Five physicians were licensed by reciprocity and one physician was licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1920)	85.8
Loyola University School of Medicine		(1939)	90.6
Harvard Medical School		(1938)	80.7
Columbia University College of Physicians and Surgeons		(1929)	79.1
School	**LICENSED BY RECIPROCITY**	**Year Grad.**	**Reciprocity with**
Northwestern University Medical School		(1927)	California
University of Minnesota Medical School		(1938)	Minnesota
Washington University School of Medicine		(1936)	Missouri
University of Tennessee College of Medicine		(1935)	Tennessee
Baylor University College of Medicine		(1936)	Texas
School	**LICENSED BY ENDORSEMENT**	**Year Grad.**	**Endorsement of**
College of Medical Evangelists		(1938)	N. B. M. Ex.

District of Columbia May Report

Mr. Paul Foley, assistant secretary, District of Columbia Board of Examiners in Medicine and Osteopathy, reports the written examination held at Washington, May 13-14, 1940. The examination covered nine subjects and included sixty questions. An average of 75 per cent was required to pass. Thirty-two candidates were examined, thirty of whom passed and two failed. Ten physicians were licensed by reciprocity and ten physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1939)	82*
George Washington University School of Medicine		(1938)	78.6,* 82.8, 84.5, 84.8, 88.8,* (1939) 81.* 81.3,* 81.5,* 84.3,* 84.5,* 85.8,* 86.1,* 86.6,* 86.8,* 87.6,* 88.1*
Georgetown University School of Medicine		(1934) (1937) 82.5, 83.3, (1938) 84.6,* (1939) 85.1*	80.6,
Rush Medical College		(1936)	75.1
Tufts College Medical School		(1935)	84
New York University College of Medicine		(1935)	83.1
Jefferson Medical College of Philadelphia		(1939)	85.6*
University of Pennsylvania School of Medicine		(1938)	85.8
University of Virginia Department of Medicine		(1939)	78.5*
Queen's University Faculty of Medicine		(1936)	84.5
University of Toronto Faculty of Medicine		(1928)	80.1
School	**FAILED**	**Year Grad.**	**Number Failed**
George Washington University School of Medicine		(1935)	1
Howard University College of Medicine		(1937)	1
School	**LICENSED BY RECIPROCITY**	**Year Grad.**	**Reciprocity with**
Georgetown University School of Medicine		(1934)	W. Virginia
Indiana University School of Medicine		(1932)	Indiana
University of Louisville School of Medicine		(1937)	Kentucky
Johns Hopkins University School of Medicine		(1935)	Maryland
University of Maryland School of Medicine and College of Physicians and Surgeons		(1936), (1937)	Maryland
Medical College of the State of South Carolina		(1911)	S. Carolina
University of Tennessee College of Medicine		(1930)	Maryland
University of Virginia Department of Medicine		(1935)	Virginia
Queen's University Faculty of Medicine		(1928)	Wisconsin
School	**LICENSED BY ENDORSEMENT**	**Year Grad.**	**Endorsement of**
George Washington University School of Medicine		(1937, 2), (1938, 2)	N. B. M. Ex.
Georgetown University School of Medicine		(1935), (1937, 2)	N. B. M. Ex.
Tufts College Medical School		(1936)	N. B. M. Ex.
University of Rochester School of Medicine		(1934)	N. B. M. Ex.
University of Oregon Medical School		(1933)	N. B. M. Ex.

* License has not been issued.

Book Notices

Handbook of the Hospital Corps United States Navy 1939. Published by the Bureau of Medicine and Surgery under the authority of the Secretary of the Navy. Cloth. Price, $1.75. Pp. 1,015, with 201 illustrations. Washington, D. C.: Supt of Doc., Government Printing Office, 1939.

The last previous edition of this book was published in 1930. Unfortunately, even the present edition is not quite up to date, since the 1935 edition of New and Nonofficial Remedies served as its basis for drugs not included in the Pharmacopeia or in the National Formulary. Planned essentially as a medical guide for the hospital corpsmen of the Navy Medical Department, the work approximates a household medical work, with chapters on minor surgery and first aid, emergency dental treatment, nursing, hygiene, allergy, the venereal diseases, field sanitation, diets, pharmacy, chemistry, the control of hospitals and many other suggestions. There is valuable information on the use of x-rays, on laboratory procedures and technic, on chemical warfare and on medicolegal problems. Certainly the book must be exceedingly useful, particularly to those members of the Navy Service who are not in immediate contact with medical officers.

Handbuch der Virusforschung. Herausgegeben von Prof. Dr. R. Doerr und Prof. Dr. C. Hallauer. Zwelte Hälfte: Die Virusarten als infektlöse Agenzien—Die Immunität gegen Virusinfektionen—Die Technik der experimentellen Erforschung phytopathogener Virusarten. Bearbeitet von J. Craigie et al. Paper. Price, 96 marks. Pp. 547-1384, with 19 illustrations. Vienna: Julius Springer, 1939.

The second half of this encyclopedic and critical review of the present state of knowledge in this rapidly advancing field of human and comparative medical science is devoted to three major fields, to wit the viruses as agents of infection, immunity against such infections, and the technic of investigation of plant viruses. Dr. Doerr surveys the natural transfers of viruses by germinative, intra-uterine, contact methods and arthropod vectors and the experimental ones by intracerebral, intraneural, intranasal and corneal inoculation and culture on the chorio-allantois of the chick embryo. He also reviews the qualitative analysis of viruses by serial passage, determination of specificities, detection of unsuspected latent infections, the establishment of genetic relationships among viruses, the etiologic associations of virus + bacteria and virus + virus, and methods of identification of viruses. The quantitative study of viruses is carried on by titration and the count of colonies of bacteriophage, lesions on the chorio-allantois, pox on skin and cornea, and lesions on leaves of plants. The significance of the results is tested by mathematical analysis.

A chapter of prime medical interest is that devoted to the spread of the virus in the body of the host. It may localize at the port of entry, enter and remain in the blood, infect an organ distant from the port, spread from the port in blood, lymph or nerve, and exhibit affinities to and interrelations with the circulatory and neurotropic paths. The experimental, pathologic and clinical consequences of virus invasion are reviewed in the light of evidences from the study of herpes and poliomyelitis, the spread within the central nervous system and the centrifugal transport from the central nervous system.

Dr. Doerr also reviews the tropisms and specific localizations of viruses discussing the as yet unsolved problems arising from the invasion of the host by nonmotile infectious agents and the theories proposed to explain it, such as germ layer affinity, tissue tropisms, neurotropism and pantropism, and the significance of variability in localization.

Dr. G. M. Findlay of the Wellcome Research Bureau of London reviews variations in viruses, noting that, although there is no clear evidence that hereditary characteristics in viruses are transmitted by structures of the type of genes, much less of chromosomes, there is no essential difference to be found between variations in viruses and those in unicellular and multicellular organisms. These variations are in virulences, types of tissue lesions in the host, antigenic character, lesion and antigenic character, and chemical and physical properties of the virus proteins. There is some evidence of the origin of new diseases within historical times, such as St. Louis encephalitis. Limitation to small geographic area suggests recent origin. Origination of variants in virus has been observed in the same tissue in the same host species, in the tissue but in different species, in a different tissue of the same and different species of host, after prolonged growth in tissue culture, and following physical changes in environment such as exposure to glycerin and high temperatures. The change in environment may conceivably act by environmental change modifying dominance, by abrupt mutations of genetic character, by selection from an already heterogeneous assemblage of viruses, or by the induction of temporary but reversible modifications. The possibility of such changes should be greater among viruses than among animals and plants because of their higher rate of propagation. This reduction of the time factor in viruses favors the study of evolution in them as over against its study in longer lived plants and animals.

Dr. O. Thomsen of Copenhagen reviews the rapidly growing literature on viruses as tumor-inducing agents. He expresses a doubt that they constitute a specialized unified group, since they appear to grade on the one hand into merely cell proliferating types and on the other into those inducing pathologic and degenerative processes.

Dr. James Craigie reviews the antigen functions of viruses and the serologic reactions of viruses in vitro, and Dr. C. Hallauer and F. Magrassi discuss acquired immunity against virus infections.

Mr. Kenneth M. Smith of the Virus Research Station of the School of Agriculture at Cambridge, England, discusses the principles of plant virus research, a field offering unique opportunities for the study of viruses not available with animal viruses. The most spectacular achievement in this field was the isolation of a virus protein of heavy molecular weight having all the properties of the virus itself. The identity of the two is suggested but not as yet satisfactorily demonstrated. The use of graded colloidal membranes in ultrafiltration has made possible the determination of the sizes of the particles of the various viruses. The concentration of virus particles and their aggregation have been determined by the statistical analysis of the numbers of local lesions produced on leaves of susceptible plants by inoculation. The study of the viruses in their insect vectors has as yet given no evidence of their multiplication in the body of the insect, though an animal virus in the mosquito has been found to multiply in it. The serologic reactions of plant viruses serve to identify them and to reveal unsuspected relationships. The existence of virus strains, cross immunities and attenuation of virulence by heat leads to hope of finding a vaccine against some plant viruses and of facilitating the breeding of resistant stocks of plants.

The book closes with a tabular presentation of all known plant and animal viruses. The two volumes reveal the complexities, great biologic and medical significances and undoubted promise of virus research.

The Management of Obstetric Difficulties. By Paul Titus, M.D., Obstetrician and Gynecologist to The St. Margaret Memorial Hospital, Pittsburgh. Second edition. Cloth. Price, $10. Pp. 968, with 373 illustrations. St. Louis: C. V. Mosby Company, 1940.

It seems odd that a book devoted exclusively to obstetric difficulties should occupy as many pages as most standard textbooks of obstetrics, which contain both normal and abnormal obstetrics. Yet a careful study of this book reveals that Titus has closely adhered to his theme. One may question only whether the subject of sterility, which occupies seventy-seven pages, and the treatment of the cervix by electrical apparatus in the nonpregnant woman properly belong in a book on obstetric difficulties. The author himself is aware of this question, because in the preface he says "Obstetrics and gynecology interlock so closely that there is ample reason for including chapters on pelvic floor damage, postpartum uterine misplacements and their treatment, tumor growths complicating pregnancy, ectopic pregnancy, electrovaginal coagulation and conization for postpartum cervicitis, as well as sterility and its treatment." The book is based on the author's extensive experience both as a clinician and as a teacher. However, throughout the book he gives credit to many of his confrères and particularly to J. Whitridge Williams, his former chief. He exhibits a conservative attitude in almost all branches of obstetrics and his advice is in accord with the best obstetric judgment. The book is written in an easily

readable style, which will appeal to students and general practitioners. The illustrations are unsurpassable and greatly enhance the value of the book. Titus has considerably improved his book in the second edition by including information about all the recent advances in the diagnosis and treatment of obstetric difficulties. He is to be congratulated on having accomplished his aim so admirably.

Studies on Pain Conduction in the Trigeminal Nerve: A Contribution to the Surgical Treatment of Facial Pain. By Olof Sjöqvist. Acta psychiatrica et neurologica Supplementum XVII. Paper. Price, $3. Pp. 139, with 38 illustrations. New York: G. E. Stechert & Co.; Helsingfors: Mercators Tryckeri, 1938.

The hope entertained in Sjöqvist's interesting treatise is that in the treatment of trigeminal neuralgia a differential section of a bundle of pain fibers in the medulla can abolish pain and preserve other sensations to the face, particularly the sense of touch. He has operated on nine patients by means of this intriguing procedure with interesting results and without deaths. That sensations carried by the trigeminal nerve become segregated in the sensory root has been demonstrated by partial sections of the sensory root at the pons. That they then are carried by different tracts in the brainstem would appear to be assured. Spiller long ago advanced such a view. Sjöqvist attempts to utilize this fact by cutting only the pain fibers in the medulla. At least, he appears to have identified this tract with sufficient accuracy to be able to spare the tactile sensation to the face after division of this tract by operation. The thermal fibers appear, however, to be so closely allied with the pain fibers that they too are lost, but on the whole the sensation of touch is quite well preserved. The burden of proof is, of course, on the introduction of a new operative attack on trigeminal neuralgia. There are now two excellent procedures which give almost perfect results. The technical side of Sjöqvist's procedure is certainly not easier than either of the two other attacks, the temporal and subcerebellar. Nor is it clear that there are any improved results for partial section of the sensory root that will abolish pain by cutting pain fibers only and with little or no loss of other types of sensation. In three of his nine cases paralysis of the vocal cord has followed the operation, owing to the contiguity of these fiber tracts. In two of his cases benefit did not result and section of the sensory root was necessary subsequently. Sjöqvist is more than fair and strikingly objective in his presentation and makes no claims for its superiority over the present approved methods. It is indeed a beautifully conceived and interesting point of attack based on highly scientific anatomic and physiologic studies. Its acceptance or rejection can be determined only with time, when its assets and liabilities are better defined. One may well doubt its value and fear the attack on the medullary contents with such concentrated important functioning tracts lying so closely adjacent. If something goes wrong, serious consequences may ensue. However, only time can evaluate any new procedure and his anticipations and fears may prove to be groundless.

Anatomie générale: Origines des formes et des structures anatomiques. Par H. Rouvière, professeur d'anatomie à la Faculté de médecine de Paris. Paper. Price, 70 francs. Pp. 192, with 96 illustrations. Paris: Masson & Cie, 1939.

Rouvière is already well known in this country through his books and papers, especially his Anatomie humaine descriptive et topographique and through his Anatomie des lymphatiques de l'homme. The present volume is the result of a thoughtful and thorough study of the physical and chemical and biologic factors which influence the growth and the structure of bones, cartilage, ligaments, circulatory apparatus, muscles and tendons, lungs, liver and kidneys. This study lies in the field intermediate between biology and physics where many think biologic science is likely to make most progress in the next few decades. Undoubtedly processes that are frankly physical or chemical play a large part in animal bodies, but always they are combined with biologic processes; it is better understanding of this combination that is needed. Biologic processes consist partly in ontogenic stimuli acting throughout life and in their interaction with environmental stimuli. The relation of the germ cells with the rest of the body is a matter of first importance in such studies. Rouvière has a definite and interesting idea of this relation, expressed with characteristic French clearness in the introduction. All parts of the body, even the most minute, are connected with the germ plasm by the blood stream; hormones and specific substances are carried from body cells to germ plasm. Changes in these parts may conceivably influence germ plasm. The latter contains dominant and recessive elements. Somatic influences may change the recessive to dominant. He finds this change more often in the mesenchyme than in the definite germ layers (ectoderm, mesoderm, entoderm); therefore it is best looked for in bones, cartilages, tendons and circulatory organs, that is in the structures which are especially considered in this book. The idea and the thorough study of these structures in relation to it make this book interesting and thought provoking for every one interested in the fundamental principles of morphology.

First Aids in Reading Difficulties. By S. Weir Newmayer, A.B., M.D. Cloth. Price, $2. Pp. 162, with illustrations. Philadelphia: North American Printing Company, 1940.

The foundation of education is reading. It is therefore desirable to develop speed in reading, to maintain respect and love for the art and science of reading, to encourage good reading and to discourage bad or wasteful reading. The author is convinced that children are ready to read in the first grade when considered from the development of the physiology of the visual organs, but of course reading involves not only seeing the words but also understanding them and interpreting them. Extensive tests have been made on children from the point of view of their ability to read so far as concerns particularly the eye. Special glasses are needed for visually handicapped children. There must be training of the eye, the provision of suitable glasses and attention to the hygiene of the eye to make certain that the child is not hampered in his education by difficulty with vision. The author provides a series of discussions covering lighting and vision which will aid children in learning to read.

The First Five Years of Life: A Guide to the Study of the Preschool Child from the Yale Clinic of Child Development. By Arnold Gesell, M.D., and Henry M. Halverson, Ph.D., Helen Thompson, Ph.D., Frances L. Ilg, M.D., Burton M. Castner, Ph.D., Louise Bates Ames, Ph.D., Catherine S. Amatruda, M.D. Cloth. Price, $3.50. Pp. 393, with illustrations. New York & London: Harper & Brothers Publishers, 1940.

The studies of Dr. Arnold Gesell and his associates on babies have been widely discussed in many important general periodicals. This study has been going on for some fifteen years, sponsored by the National Research Council and similar organizations. Some of the previous volumes have discussed psychologic development from birth to the sixth year, the psychology of early growth and similar subjects. The present volume traces carefully the growth of the child from 1 to 5, discussing his abilities at various ages. The book is fully illustrated with photographs taken from motion pictures, which provide definite evidence of steps in the motor progress of the child. Other chapters concern language development, personal-social behavior, adaptations to peculiar conditions and studies of individuality. There is also a complete presentation of the records used, a bibliography and an index. The work of the Yale Clinic of Child Development is recognized as standard in this field. It will be of immense interest to all of those concerned in the study and training of children and is obviously invaluable particularly to the pediatrician, who must have far more than an ordinary knowledge of child psychology.

Pneumoconiosis (Silicosis): The Story of Dusty Lungs. A Preliminary Report. By Lewis Gregory Cole, M.D., Director of Silicotic Research, John B. Pierce Foundation, New York City, and William Gregory Cole, M.D. Cloth. Price, $1. Pp. 52, with appendix with illustrations. New York: John B. Pierce Foundation, 1940.

The authors state that this booklet was written free from the bias of writers who are familiar with the literature. Professing to have this unfamiliarity, they then promptly belie their statement with intimate descriptions of work of others and pay tribute to the past teachings of many, particularly in the roentgenology of silicosis. The book claims to present revolutionary and novel ideas. The only novelty discovered was the introduction of inept lay terms to take the place of technical nomenclature which has stood up well and has been understood by technical persons, including the authors. In order to study and to understand the metabolism of inhaled

silica particles, phagocytosis and fibrosis, it is not necessary to be led "on a travelogue of dust flecks." The naive omission of the proved etiology and mineralogy of silicosis, covered so adequately by Gardner, and the total ignoring of the role of tuberculosis in the silicosis problem detract greatly from the report. The authors would seem to have been badly mixed on the use of dark field microscopy vs. polarized light, which are bandied about as being more or less synonymous. The appendixes consist of two of the authors' reprints, one on the roentgenologic diagnosis of silicosis (*Radiology* **33**:261 [Sept.] 1939) and the other on the dyspnea of silicosis (THE JOURNAL, Sept. 23, 1939, p. 1216).

Textbook of Healthful Living. By Harold S. Diehl, M.A., M.D., Sc.D., Professor of Preventive Medicine and Public Health, and Dean of the Medical Sciences, University of Minnesota, Minneapolis. Second edition. Cloth. Price, $2.50. Pp. 634, with 63 illustrations. New York & London: McGraw-Hill Book Company, Inc., 1939.

First published as a popular work in hygiene, this volume has now become a textbook used in many schools and colleges. The present edition is especially revised for that purpose. There are new chapters on modern parenthood, community health and organized health work. Some of the sections of the original book have been omitted as not having special interest for the student in hygiene. A number of appendixes to the volume provide tables of standard weights, nutritional values of foods, data on the control of communicable diseases, and especially a personal health record so that every student may fill this out for himself and thereby receive more information as to the factors that are important to personal health and hygiene than in any other way. The great success of this volume is an indication of its usefulness.

Trapping the Common Cold. By George Sanford Foster, M.D. Cloth. Price, $1.25. Pp. 125. New York, London & Edinburgh: Fleming H. Revell Company, 1940.

This book sets forth the author's ideas of how to avoid the common cold. Some of the advice with respect to sleep, diet, exercise and the avoidance of infection is excellent, but it is mixed with unscientific material such as the advice to use raw milk, the insistence on a special posture during sleep, overemphasis on exercise, cold bathing and posture and, above all, the unqualified promise with respect to the common cold that its prevention "is easy and the knowledge of means ready at hand." The text is repetitious and not well organized. In mentioning the infectious agents involved in the common cold, the filtrable virus is omitted. The dietary advice is sketchy and inadequate.

Beiträge zur Physiologie und Klinik der weiblichen Genitalorgane im Kindesalter. Von Priv. Doz. Dr. László v. Dobszay. Mit einem Vorwort von Prof. Dr. Jenö Kramár, Direktor der Universitätskinderklinik in Szeged. Acta litterarum ac scientiarum Reg. Universitatis Hung. Francisco-Iosephinae, Sectio medicorum, Tom. VIII, Fasc. 3. Redigunt: J. Baló, D. Miskolczy et St. Rusznyák. (Acta med. Szeged). Paper. Price, 7 marks. Pp. 152, with 7 illustrations. Budapest: Eggenbergersche Buchhandlung Karl Rényi; Leipzig: Johann Ambrosius Barth, 1939.

This book, which deals with the physiology and pathology of the female reproductive organs of children, should be of interest to gynecologists, pediatricians, dermatologists and those interested in venereal diseases. It is generally assumed that the internal genitalia of female children lie dormant during childhood and hence cannot give rise to any disturbances. This is not true. Recent advances in endocrinology, for example, have demonstrated that activity does occur in these organs, particularly shortly after birth and at puberty. The author has devoted eight years of investigation to this study of the female reproductive organs in young girls and he has reviewed the literature on this subject. The book is divided into two parts, one of which deals with the physiology of the genital organs in female children and the other with pathologic conditions in these organs. In the first section the author first describes the anatomy of the genitalia and then he takes up the physiologic phenomena which appear in the newborn and in girls at puberty. In the second section the author considers gonorrheal infections and nongonorrheal infections in young girls. At the end of the book is an extensive bibliography. This is an excellent reference book for all who are interested in the medical aspects of female children.

The Medical Annual: A Year Book of Treatment and Practitioner's Index. Edited by H. Letheby Tidy, M.A., M.D., F.R.C.P., and A. Rendle Short, M.D., B.S., B.Sc. Fifty-Eighth Year 1940. Cloth. Price, 20s. Pp. 604, with 127 illustrations. Bristol: John Wright & Sons Ltd., 1940.

Featured in the Medical Annual for 1940 is material on the sulfonamides, flying, the vitamins and the treatment of war injuries. This excellent review of the medical literature of the year is now in its fifty-eighth annual volume, indicating obviously that it serves a useful purpose. The British contributors are persons of note who have had extensive experience in the fields for which they are responsible. This volume does for Great Britain exactly the same service that is filled by the so-called Handbook series in the United States. At the end of the volume one finds a practitioner's index of new pharmaceutic and dietetic preparations. All the information here published is supplied by the manufacturers without the slightest indication as to whether or not any of the claims made have been verified. Also as a supplement one finds a complete list of the British books published during the year and also new editions. Finally there are a directory of mental and other institutions and spas in Great Britain and a list of medical and scientific periodicals.

Illustration: Its Technique and Application to the Sciences. By Carl D. Clarke, M.A., Associate Professor of Art as Applied to Medicine, University of Maryland, Baltimore. Cloth. Price, $5.50. Pp. 394, with 272 illustrations. Baltimore: John D. Lucas Company, Publishers, 1939.

Today medical illustration is a specialty with several branches. The author of this volume teaches art as applied to medicine in the University of Maryland and has had extensive experiences in all the illustrative technics, including medical drawing and painting, molding and casting, and photography. The present volume contains thirty-two chapters, which begin with a history of medical drawing and painting. Then come introductions to the elements of drawing, including full descriptions of materials, after which are chapters on surgery, pathology, chemical drawings, lettering, microscopic subjects and photography. The final chapter, which is not a biologic chapter, is a fundamental consideration of the reproduction of drawings. The book is magnificently illustrated and may be considered one of the best fundamental contributions thus far available in this field.

Lehrbuch der speziellen pathologischen Anatomie für Studierende und Ärzte. Von Dr. Eduard Kaufmann. Band II, Teil 1. Lieferung 2: Geschlechtsorgane. Anhang: Literaturangaben. Bearbeitet von H. Gögl und F. J. Lang. Ninth and tenth edition. Paper. Pp. 1361-1716; 279*-326*, with 137 illustrations. Berlin: Walter de Gruyter & Co., 1940.

This instalment of the ninth and tenth edition of Kaufmann's Pathologic Anatomy deals with the organs of reproduction including the mammary gland. The previous part was reviewed in THE JOURNAL, Feb. 4, 1939, page 468. The editors of the present instalment have done their work well. The original character of the book is maintained successfully. The text, clearly written and well arranged, abounds with references to the literature. The bibliography, closely printed, fills forty-seven pages, which eventually are to be bound with the bibliographies of other parts. The illustrations, all black and white, at times somewhat too diagrammatic, are instructive.

Studies on Codeine Addiction. By C. K. Himmelsbach, Howard L. Andrews, Robert H. Felix, Fred W. Oberst and Lowrey F. Davenport. Federal Security Agency, United States Public Health Service. Supplement No. 158 to the Public Health Reports. Paper. Price, 15 cents. Pp. 67, with illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1940.

This pamphlet, issued under the authority of the Federal Security Agency of the United States Public Health Service, reviews the available medical literature dealing with addiction to codeine and then reports some studies on this subject carried out at Fort Leavenworth, Kan., and at Lexington, Ky. A third part is devoted to a study of the effects of codeine on the electrical potentials of the cerebral cortex. Part four concerns the effects of codeine addiction on behavior; part five, the urinary excretion of codeine; and part six, the use of codeine for the control of tuberculous cough. The final portion of this report is on the significance of codeine as an addicting drug.

It seems to be well established that codeine has an addiction liability, even though the amount of codeine required to satisfy

and support a preestablished addiction to morphine is 5.2 times greater. The evidence seems to indicate that codeine gives less psychic satisfaction than morphine, but its action on the cortex does not differ essentially from that of morphine. Thus the investigators are convinced that the pharmacologic effects of codeine are of the same nature but of a lower order than morphine in all of its characteristics. The reduction in liability to addiction, although considerable, has not reached the point where this drug can be used liberally or indiscriminately over protracted periods. Attention is called particularly to the fact that large doses are used to control the cough in tuberculous patients and that this is both wasteful and inherently dangerous. The final conclusion of the authors is that "Codeine addiction does not result from the use of a bad thing but from the abuse of a very good thing."

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Industrial Blindness; Competency of Optometrist as Expert Witness.—Reeder sustained an injury to his right eye when it was struck by a piece of coal while he was working at a cutting machine in the Black Starr Coal Corporation's mine. He claimed that thereafter his vision in that eye was greatly impaired. He was awarded compensation for permanent loss of vision in one eye by the workmen's compensation board of Kentucky. From a judgment of the circuit court, Harlan County, Ky., affirming that award, the employer appealed to the Court of Appeals of Kentucky.

All the expert witnesses agreed that Reeder had a scar on his right eye, that his vision in that eye was 20/200 and that such vision constituted about 10 per cent of normal vision. Two physicians, eminent eye specialists or oculists, who had examined Reeder's eyes testified that the impairment of Reeder's vision was not due to the injury to his eye but that he was a psychoneurotic and that his loss of vision was "a matter of mind rather than a reality." They further stated that they had applied well known deceit tests but had been unable to detect malingering. However, an optometrist who had also examined Reeder's eyes was permitted to testify that in his opinion the loss of vision was due to the scar on the eye or to the injury causing it. On appeal, the appellant contended that the lower court had erred in admitting the optometrist's testimony because an optometrist is not qualified to testify as an expert witness as to causes of deficiency of vision. The Court of Appeals, however, pointed out that on being asked concerning his qualifications the optometrist in question had testified that he had long experience in the practice of his profession, that while the primary function of optometrists is the testing of eyes and the fitting of glasses they are also trained to recognize disease conditions of the eye; that he himself was trained and skilled in the examination for and the diagnosis of conditions of the eye but he did not give treatment, and that when treatment was indicated he sent his patients to a physician specializing in diseases of the eye. Also, when asked concerning matters of evidence about which the oculists had testified, he displayed general knowledge concerning the subject. In view of this evidence of training and experience the court was of the opinion that the optometrist was competent to testify as an expert witness. In so holding, the court relied on 22 C. J., page 52, note (*d*), and page 519, section 606, in which it is stated that when the occupation of a witness is such as to afford him special opportunity for acquiring knowledge and experience with respect to a kindred occupation and to render it probable that such knowledge and experience were acquired, the witness is competent to testify as to matters connected with the latter occupation. As was announced in *King* v. *King*, 161 Miss. 51, 134 S. W. 827, an expert witness need not be infallible or show the highest degree of skill but it is generally sufficient if he possesses peculiar knowledge respecting the matters involved not likely to be possessed by ordinary laymen.

The appellant also contended that industrial blindness relates to the sight of both eyes and not to one eye only. While the Court of Appeals did not specifically pass on this question, it did so indirectly when it adopted the undisputed testimony of the two physicians and the optometrist that Reeder had sustained a loss of 90 per cent of the vision in his right eye and that such constituted "industrial blindness" in that eye.

Accordingly, the Court of Appeals affirmed the judgment of the circuit court upholding the award of compensation.—*Black Starr Coal Corporation v. Reeder (Ky.), 128 S. W. (2d) 905.*

Workmen's Compensation Acts: Aggravation of Preexisting Heart Disease by "Unusual Effort" Compensable.—Rother, who was 53 years of age and had been afflicted with a heart condition for several years, was employed by the defendant company after examination by a physician. He was put to work unloading a freight car which contained crates of oranges weighing from 60 to 85 pounds. Sometime between one half and three quarters of an hour after he commenced to work he was found lying face down "breathing hard in a shivery manner, shaking." He died a few minutes thereafter. His widow, the claimant, filed a claim for compensation under the workmen's compensation act of New Jersey. The workmen's compensation bureau found that Rother's death was due to his employment in that unusual effort exerted by him had aggravated his preexisting heart condition and caused his death. The bureau awarded the claimant compensation, which award was affirmed by the court of common pleas of Hudson County, N. J. The employer then petitioned the supreme court of New Jersey for a writ of certiorari to review that judgment.

The only question that the supreme court was called on to decide was whether Rother had died solely as the result of a serious heart condition with which he had been afflicted for several years prior to his death or whether his death was the result of unusual effort necessarily expended in his work which had aggravated his preexisting heart condition. In the opinion of the court, the duties of Rother's employment did call for unusual effort, and the unusual exertion which he expended aggravated his preexisting heart condition with the result that he died of "syncope due to cardiac disease probably myocardial in nature." The court concluded that under such circumstances Rother's death rose out of and in the course of his employment and was therefore compensable. Accordingly, the supreme court refused to issue the writ of certiorari.—*Rother v. Merchants Refrigerating Co. (N. J.), 6 A. (2d) 404.*

Society Proceedings

COMING MEETINGS

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Excelsior Springs, Mo., Sept. 26-28. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.
American Association of Railway Surgeons, Chicago, Sept. 16-18. Dr. Daniel B. Moss, 547 West Jackson Blvd., Chicago, Secretary.
American Congress of Physical Therapy, Cleveland, Sept. 2-6. Dr. Richard Kovacs, 2 East 88th St., New York, Secretary.
American Hospital Association, Boston, Sept. 16-20. Dr. Bert W. Caldwell, 18 East Division St., Chicago, Executive Secretary.
American Roentgen Ray Society, Boston, Sept. 26-Oct. 4. Dr. Carleton B. Peirce, Royal Victoria Hospital, Montreal, Canada, Secretary.
Colorado State Medical Society, Glenwood Springs, Sept. 11-14. Mr. Harvey T. Sethman, 537 Republic Bldg., Denver, Executive Secretary.
Idaho State Medical Association, Sun Valley, Sept. 11-14. Dr. J. N. Davis, 204 Fourth Ave., East, Twin Falls, Secretary.
Kentucky State Medical Association, Lexington, Sept. 16-19. Dr. A. T. McCormack, 620 South Third St., Louisville, Secretary.
Michigan State Medical Society, Detroit, Sept. 24-27. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing, Secretary.
Mississippi Valley Medical Society, Rock Island, Ill., Sept. 25-27. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.
National Medical Association, Houston, Tex., Aug. 12-16. Dr. John T. Givens, 1108 Church St., Norfolk, Va., General Secretary.
Oregon State Medical Society, Eugene, Sept. 4-7. Dr. Morris L. Bridgeman, 1020 S.W. Taylor St., Portland, Secretary.
Utah State Medical Association, Ogden, Aug. 29-31. Dr. D. G. Edmunds, 610 McIntyre Bldg., Salt Lake City, Secretary.
Washington State Medical Association, Tacoma, Aug. 26-28. Dr. V. W. Spickard, 1305 Fourth Ave., Seattle, Secretary.
Wisconsin, State Medical Society of, Milwaukee, Sept. 18-20. Mr. J. G. Crownhart, 110 East Main St., Madison, Secretary.
Wyoming State Medical Society, Sheridan, Aug. 11-13. Dr. M. C. Keith, State Department of Health, Cheyenne, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1930 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

9:365-408 (May) 1940

Some Contributions of Nutritional Research to Clinical Medicine. E. V. McCollum, Baltimore.—p. 365.

*Status Asthmaticus: Specific Chemotherapy in Treatment—Preliminary Report. C. K. Weil and H. J. Climo, Montgomery.—p. 370.

The Health Worker: How the Layman Looks on Him. E. V. Caldwell, Huntsville.—p. 374.

Community Health as Interpreted by a Private Practitioner. W. W. Alexander, Florence.—p. 377.

Status Asthmaticus.—Weil and Climo cite seven cases of status asthmaticus treated with sulfanilamide. Six of these responded promptly by rapid relief of symptoms. In the exception the sputum showed a preponderance of pneumococci but after treatment with sulfapyridine relief was prompt. One of the patients with chronic bronchitis and emphysema had staphylococci in his sputum but nevertheless he responded to sulfanilamide therapy. In this type of case sulfathiazole might be expected to give better results. The authors do not suggest that sulfanilamide and its derivatives will relieve all cases of status asthmaticus or that they will actually cure asthma. There may be cases of status asthmaticus which result from an overwhelming contact with some extrinsic substance of antigenic quality in which they do not know what effect sulfanilamide may have. In cases of status asthmaticus which result from respiratory infection, sulfanilamide and sulfapyridine seem to offer the possibility of dramatic relief. The authors do not yet feel certain about the optimal dose of sulfanilamide and its derivatives. They have used the following schedule for adults: 20 grains (1.3 Gm.) every six hours for two days, 15 grains (1 Gm.) every six hours for three days and 10 grains (0.65 Gm.) every six hours for seven days. There is still a question as to how long treatment should be continued. It is not known whether this method will be as efficacious in cases of chronic bacterial asthma or so-called bronchitis with asthma, even in the absence of status asthmaticus. The principles underlying the two conditions are similar and should respond to similar therapy. This method of treating status asthmaticus may afford relief to some patients with less prolonged hospitalization and less expensive medication than has been possible in the past. When the indications for the use of these drugs, the proper dosage and the duration of treatment have been well established, the outlook for the asthmatic patient may be improved considerably and the late complications of asthma—chronic bronchitis, bronchiectasis, emphysema, pulmonary fibrosis, cardiac hypertrophy and myocardial damage—prevented.

American Journal of Cancer, New York

39:1-148 (May) 1940

Histologic Analysis of Tumors: Critical Review. L. Foulds, London, England.—p. 1.

Spontaneous Primary Hepatomas in Mice of Strain C3H: Study of Incidence, Sex Distribution and Morbid Anatomy. E. L. Burns and J. R. Schenken, New Orleans.—p. 25.

Transplantable Carcinoma of Rat Breast. M. J. Eisen, New York.—p. 36.

Investigations on New Heterologous Tumor, "Budapest 1938," Successfully Propagated in Hungarian White Rats. E. de Balogh, Budapest, Hungary.—p. 45.

Development of Sarcoma in Mice Following Long Continued Injections of Buffered Solution of Hydrochloric Acid. V. Suntzeff, R. S. Babcock and L. Loeb, St. Louis.—p. 56.

Stomach Lesions in Rats Kept on Diets Deficient in Vitamin A. L. S. Fridericia, S. Gudjonsson, B. Vimtrup, S. Clemmesen and J. Clemmesen, Copenhagen, Denmark.—p. 61.

Volume of Injection and Concentration of Carcinogenic Chemical as Factors in Initiation of Malignant Process and Their Bearing on Somatic Mutation Hypothesis. W. F. Dunning, M. R. Curtis and F. C. Wood, New York.—p. 70.

Tumor Incidence in Line A Albino Mice Following Injections of Progynon-B. E. Elizabeth Jones, Brookline, Mass.—p. 94.

Glycolysis of Erythrocytes During Tumor Growth. H. Werner and A. Kleinzeller, Brno, Czechoslovakia.—p. 100.

Possible Method of Transmission of Susceptibility to Breast Cancer in Mice. J. J. Bittner, Bar Harbor, Maine.—p. 104.

American Journal of Diseases of Children, Chicago

59:1167-1438 (June) 1940

*Clinical Studies of Vitamin A in Infants and in Children. C. D. May, K. D. Blackfan, Boston; J. F. McCreary, Toronto, and F. H. Allen Jr., Holyoke, Mass.—p. 1167.

Respiratory Metabolism in Infancy and in Childhood: XXIII. Daily Energy Requirements of Premature Infants. H. H. Gordon, S. Z. Levine, W. C. Deamer and H. McNamara, New York.—p. 1185.

Distorted Speech in Young Children. I. W. Karlin, Adella C. Youtz and Lou Kennedy, Brooklyn.—p. 1203.

Effect of Irradiation of Air in Ward on Incidence of Infections of Respiratory Tract. L. H. Barenberg, D. Greene and L. Greenspan, New York.—p. 1219.

VIII. Background and Social Adjustment of Thyroid Deficient Children Receiving Glandular Therapy. Joyce W. McDonald, A. W. Brown and I. P. Bronstein, Chicago.—p. 1227.

Transitory Synovitis of Hip Joint in Children. S. Rauch, Brooklyn.—p. 1245.

*Duration of Immunity to Diphtheria Achieved by Toxin-Antitoxin and Alum Precipitated Toxoid. W. B. Nevius and Ada C. McGrath, East Orange, N. J.—p. 1266.

Cirrhosis of Liver in Children. G. T. Harrell and A. McBryde, Durham, N. C.—p. 1301.

Vitamin A in Children.—May and his associates describe a photoelectric colorimeter technic, using selective light filters, for the quantitative estimation of vitamin A and the carotenoids in small amounts of blood serum. With the technic (1) the rapidly changing blue color may be read instantly at its maximum, (2) subjective error is eliminated, (3) selective light filters allow for correction due to blue color arising from the carotenoids, (4) carotenoids and vitamin A may be determined with the same aliquot of extract, (5) the small amounts of color obtainable from 1 cc. of blood serum can be measured accurately and (6) the entire procedure is simple to perform. Its accuracy and dependability were indicated by the results obtained when duplicate analyses for carotenoids and vitamin A were done on separate specimens of the same blood. By means of the technic, normal well nourished children from birth to 12 years of age were found to have levels of vitamin A in their blood ranging from 5.5 to 27.3 units. The levels of carotenoids also covered a wide range, from 3.1 to 75.7 units. The wide range of values is not confusing, as the alterations in the levels of vitamin A and carotenoids in pathologic states are beyond the limits seen under normal circumstances. In acute infections with fever, the blood levels of both vitamin A and carotenoids decrease. The levels may rise spontaneously to normal during the subsidence of the infection. As the bodily stores of vitamin A are depleted the carotenoids in the blood decrease, and not until these have become considerably lowered does the level of vitamin A begin to fall. In some of the infants whose intake of vitamin A and carotenoids was restricted, the levels in the blood dropped considerably below the lowest limits of normal. The low levels in the blood were the only clue to a deficiency of vitamin A and dropped before the appearance of cornified epithelial cells in the conjunctiva and respiratory and genito-urinary tracts. The authors' studies indicate that the vitamin A customarily supplied to infants in ordinary whole cow's milk formulas may be scarcely sufficient to maintain an optimal level of vitamin A in the blood. If the absorption of vitamin A from the intestine is impaired, depletion of the bodily stores and lowering of the level in the blood may be expected, even when the vitamin A intake is normal. The study of intestinal absorption has been facilitated by the utilization of a vitamin A absorption test (Chesney and McCoord, 1934). Failure of the level to rise to normal after ingestion of vitamin A (0.1 cc. of percamorph liver oil per pound of body weight) used in the absorption test may be assumed to indicate a decrease in intestinal absorption. Impaired intestinal absorption has been found in congenital obliteration of the bile ducts, fibrosis of the pancreas, celiac disease and cretinism, in which the average rise was 8.2 units after absorption test doses as compared to 129.7 units in normal children. There is no advantage in parenteral administration of the vitamin. The defect in absorption may be easily overcome by the

oral administration of unusually large amounts of vitamin A, preferably in divided doses. The presence of a low absorption curve is an indication for the administration of large amounts of vitamin A if normal levels are to be maintained and deficiency prevented.

Duration of Immunity to Diphtheria.—Nevius and McGrath compared the results of Schick tests on groups of school children five years after immunization with toxin-antitoxin and with alum precipitated toxoid. Seventy-eight children who had been given three 1 cc. doses of diphtheria toxin-antitoxin in 1932 and who had negative Schick reactions one year later were again given the Schick test in 1937 and seventy-five, or 96 per cent, still reacted negatively. Of seventy-two children who were given 1 cc. of alum precipitated toxoid in the fall of 1933 and had negative Schick reactions in 1934 only fifty-eight children, or 80 per cent, still reacted negatively in the fall of 1938. It appears that, while alum precipitated toxoid produces a prompt negative Schick reaction in a high percentage of cases, the result is transient and disappears after five years in about 20 per cent of children. The study bears out the general belief that the immunity from a single dose of 1 cc. of alum precipitated toxoid does not last as long as that from the older preparations. This should encourage the use not of the older toxin-antitoxin preparations but of two 1 cc. doses of alum precipitated toxoid two or three weeks apart and Schick retesting of the children at regular intervals. Since the ideal time for immunization of the infant is when he is between 6 and 9 months of age, Schick tests should be done at the ages of 12 months, 3 years and 5 years or just before the child enters school. In the event that the reaction becomes positive, another 1 cc. dose of toxoid should be given with subsequent retesting.

American J. Obstetrics and Gynecology, St. Louis

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Some Sociologic and Psychologic Observations on Abortion: Study of 537 Cases. Virginia Clay Hamilton, New York.—p. 919.
Weight Changes During Pregnancy and Puerperium. H. J. Stander and J. B. Pastore, New York.—p. 928.
*Clinical Study of Stilbestrol. M. E. Davis, Chicago.—p. 938.
Endometriosis: Study of 260 Private Hospital Cases. R. Fallas and G. Rosenblum, Los Angeles.—p. 964.
Pseudo-Uterus Arcuatus and Functional Malformations of Uterus: Their Effect on Pregnancy and Parturition. L. Rudolph, Chicago.—p. 975.
Experiment in Cancer Control: Preliminary Report on Periodic Pelvic Examinations of 1,000 Well Women. Catharine Macfarlane, Faith S. Fetterman and Margaret C. Sturgis, Philadelphia.—p. 983.
Study of Incidence of Syphilis in Pregnant Women and Some Results of Therapy. V. Moseley, J. L. Callaway and Jane Stiles Sharpe, Durham, N. C.—p. 990.
*Results of Treatment in Carcinoma of Uterine Cervix. R. W. Teahan and H. Wammock, Philadelphia.—p. 995.
*Observations on Pathology of Trichomonas Vaginitis and on Vaginal Implants with Trichomonas Vaginalis and Trichomonas Intestinalis. J. F. Kessel and J. A. Gafford Jr., Los Angeles.—p. 1005.
Coexistence of Carcinoma and Tuberculosis of Uterus. J. M. Ravid and E. Scharfman, Brooklyn.—p. 1025.
Appraisal of Routine Use of Special Postpartum Exercise. W. B. D. Van Auken, Troy, N. Y.—p. 1032.
Blood Phosphatase in Pregnancy an Indication of Twins: Preliminary Report. J. H. Ebbs and W. A. Scott, with technical assistance of W. M. Johnstone, Toronto.—p. 1043.
Oral Administration of Stilbestrol. J. C. Weed, B. B. Weinstein, F. R. Lock, J. W. Douglas and C. G. Collins, New Orleans.—p. 1047.
Carcinoma of Cervix in 7 Months Old Infant. E. G. Waters, Jersey City, N. J.—p. 1055.
Acute Anterior Poliomyelitis Complicating Carcinoma of Cervix in 30 Year Old Female. L. Litter and H. Strauss, Brooklyn.—p. 1058.
Friedman Tests with Ovarian Pregnancy. C. H. Davis and Verna Stevens-Young, Wilmington, Del.—p. 1063.
Cancer of Cervix in Virgin with Intact Hymen. A. F. Lash, Chicago.—p. 1070.

Stilbestrol.—Davis used stilbestrol in the treatment of 100 women with menopausic symptoms. Each patient received 1 mg. of stilbestrol at bedtime and this was sufficient to control the symptoms. About 20 per cent of the women who at first were given 5 mg. of stilbestrol daily complained of nausea, with or without vomiting, or of an uncomfortable sensation in the abdomen. When the daily dose was reduced to 1 mg., most of these women could tolerate the medication without any discomfort. In only three instances did the morning nausea and the upset feeling persist. Ninety-three of the 100 women were completely relieved of their menopausic symptoms, hot flushes, headaches, tenseness at the back of the head and neck muscles, nervous manifestations, hyperexcitability, irritability and mental depression. The menopausic symptoms of four women were only partly relieved. Two of these took the drug intermittently. Twelve women in the group had been treated with the natural estrogens by parenteral administration. Some of these patients had fairly complete relief from symptoms but most of them had little relief but continued treatment because it was the best therapy that could be offered. It was difficult to substitute oral medication for the hypodermic injections, but the improvement that followed stilbestrol convinced all but one woman that the change was a desirable one. These women were rapidly freed from all their flushes and of most of the other concomitant complaints. Medication must be continued until the symptoms begin to wane or disappear. After several months of medication the amount of the drug can be reduced. If symptoms return the daily dose should be increased. A sudden cessation of therapy is often followed by vaginal bleeding within ten to twenty days. This is the characteristic withdrawal phenomenon. Stilbestrol was the ideal estrogen for the treatment of two cases of primary amenorrhea, with its attendant underdevelopment of secondary sex characteristics. The daily oral administration of 1 mg. of the drug was sufficient to produce physical and sexual maturity. The changes induced in these patients in a month were truly astounding. The prepuberal state was rapidly replaced by the physical and organic development of the mature woman. All the secondary sex characters developed. The reproductive organs assumed the normal adult type. All this was accomplished in several months, whereas normal adolescence requires three or four years. The gonads were the only reproductive organs that were not affected and remained dormant. These young women remain normal only if treatment is continued. Only careful clinical observations and experimental studies over long periods will determine the desirability of continued treatment and its safety. The amount of stilbestrol necessary to maintain the optimal development of the individual must be ascertained. About 1 mg. daily has been sufficient to prevent regression, but it is possible that this amount is too large. Careful endocrine assays may reveal the optimal daily consumption of this drug. Bleeding, with some degree of regularity, occurs from seven to twenty days following withdrawal of the drug as well as on continued medication. The only difference between true ovulatory menstruation and these anovulatory bleedings is in the endometrial picture, which resembles that prior to ovulation. The bleeding is preceded by the usual premenstrual prodromes. The blood loss is scanty in amount and there is no loss of desquamated endometrial fragments. Cutaneous pigmentation occurs and is most marked in the nipples and the areolas, but the linea alba as well as other mildly pigmented areas become intensely discolored. The nature of this pigmentation is being studied.

Results of Treatment in Carcinoma of Cervix.—From 1928 to 1937 Teahan and Wammock saw 229 cases of carcinoma of the uterine cervix; 136 of these were seen before Dec. 1, 1934, and therefore have been observed for five years or more. Treatment has been exclusively by irradiation with x-rays and radium. Of the 136 patients, 122 were treated and twenty-six survived five years or more. The absolute cure rate is 19.1 per cent and the relative cure rate 21.3 per cent. Treatment of sixty-nine patients was initiated by the authors and the five year cure rate in this group is 33⅓ per cent. Of the fifty-three patients who had received some treatment elsewhere, the disease was either not controlled or it recurred. These patients were given more treatment, but only three (5.7 per cent) survived five years. Not all patients received combined roentgen and radium therapy. In some of the advanced cases the use of radium appeared to be contraindicated. Fifty-one patients received the combined x-rays and radium, and the five year cure rate in this group is 37.3 per cent. Vesicovaginal fistulas developed in two patients of this group. Four fistulas occurred among the patients receiving an incomplete cycle of treatment. Ten fistulas occurred among those patients who received their initial treatment elsewhere, and one in a patient receiving no treatment. It appears that, except for the extent of the disease, the initial treatment is the most important factor in determining the ultimate result. Inquiry showed that, while the patient is consulting a physician more promptly after the appearance of the initial sign, the interval between the first visit and the first pelvic examination does not appear to be shortened.

Pathology of Trichomonas Vaginitis.—Kessel and Gafford state that serial sections of biopsies from areas of hemorrhage and granulation from cases diagnosed as trichomonas vaginitis indicate that the pathologic change is not produced alone by simple invasion of flagellates from the lumen of the vagina but that some additional mechanism exists, either toxic or bacterial in nature, which is partially responsible for primary tissue changes. Implants into normal vaginas of exudate from cases of trichomonas vaginitis containing Trichomonas vaginalis and bacteria resulted in the occurrence of characteristic vaginitis, while implants of cultures of Trichomonas vaginalis and bacteria produced only one case of typical vaginitis and implants of Escherichia coli and an alpha streptococcus in culture produced only a mild vaginitis without characteristic discharge. Experimental implants of Trichomonas vaginalis to human and monkey vaginas resulted in infection, while attempts to infect human and monkey vaginas with Trichomonas intestinalis ended with negative results. The study fails to support the theory that the trichomonads which infect the vagina are of intestinal origin. The evidence supports the theory that Trichomonas vaginalis and Trichomonas intestinalis (Trichomonas hominis) are distinct species, since they exhibit both morphologic and environmental differences.

American Journal of Pathology, Boston

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Spontaneous Tumors in Two Colonies of Rats of the Wistar Institute of Anatomy and Biology. H. L. Ratcliffe, Philadelphia.—p. 237.
Morphologic Alterations in Gasserian Ganglion Cells and Their Association with Senescence in Man. R. C. Truex, Minneapolis and New York.—p. 255.
Physiologic Hypertrophy of Parathyroids, Its Cause and Its Relation to Rickets. A. W. Ham, N. Littner, T. G. H. Drake, E. C. Robertson and F. F. Tisdall, Toronto.—p. 277.
Studies in Carcinogenesis: IX Hydrocarbon-Cholesterol Pellets in Strain D Mice. M. J. Shear, Cambridge, Mass., and F. W. Ilfeld, Boston. —p. 287.
Id.: X. Production of Tumors by 3:4-Benzpyrene in Rats Fed Diets Containing Different Levels of Vitamin A. P. R. Howe, M. D. Elliott, Boston, and M. J. Shear, Cambridge, Mass.—p. 295.
Id.: XI. Development of Skin Tumors in Mice Painted with 3:4-Benzpyrene and Creosote Oil Fractions. S. Cabot, Boston; N. Shear and M. J. Shear, with technical assistance of A. Perrault, Cambridge, Mass.—p. 301.
Metastatic Neuroblastoma in Bone Presenting Ewing Syndrome, with Discussion of "Ewing's Sarcoma." R. A. Willis, Victoria, Australia. —p. 317.
Meningococcic Endocarditis and Myocarditis: Report of Case with Unusual Lesions in Arterial Tree. M. G. Whillans, Toronto.—p. 365.

Archives of Internal Medicine, Chicago

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Insulin and Cerebral Damage. F. Klein and J. A. Ligterink, Groningen, Netherlands.—p. 1085.
Dissecting Aneurysm of Aorta. J. A. Reisinger, Washington, D. C. —p. 1097.
*Hyperthyroidism and Diabetes. J. F. Regan and R. M. Wilder, Rochester, Minn.—p. 1116.
Clinical Manifestations of Paroxysmal Hypertension Associated with Pheochromocytoma of Adrenal: Report of Proved and of Doubtful Case. E. F. Van Epps, O. R. Hyndman and J. A. Greene, Iowa City.—p. 1123.
*Clinical Value of Determination of Cholesterol Esters of Blood in Hepatic Disease. C. H. Greene, R. Hotz and Evelyn Leahy, New York. —p. 1130.
Treatment of Pneumonia with Sulfapyridine: Observations on Toxic Reactions. H. K. Detweiler, H. I. Kinsey, W. H. Brown and W. R. Reasby, Toronto.—p. 1144.
*Purpura Haemorrhagica Following Neoarsphenamine and Bismarsen Therapy: Further Studies on Sensitivity to Arsphenamine and Tolerance to Mapharsen. E. H. Falconer and N. N. Epstein, San Francisco. —p. 1158.
Degenerative Lesions in Cervical Portion of Spine. T. Horwitz, Philadelphia.—p. 1178.
Glomerular Nephritis Following Infections of Skin. P. H. Futcher, New York.—p. 1192.
Blood: Review of Recent Literature. R. Isaacs, C. C. Sturgis, F. H. Bethell and S. M. Goldhamer, Ann Arbor, Mich.—p. 1211.

Hyperthyroidism and Diabetes.—Regan and Wilder add sixty-one cases of hyperthyroidism and diabetes to the thirty-eight that Wilder reported in 1926. They state that during the twelve years between the reports the incidence of frank diabetes as a complication of hyperthyroidism increased from 1.1 per cent to 3.2 per cent. As in the first report, its occurrence is more frequent in adenomatous goiter with hyperthyroidism (5.6 per cent) than in exophthalmic goiter (1.7 per cent). The fact that exophthalmic goiter occurs in younger patients may partially explain this discrepancy. Patients with exophthalmic goiter generally seek medical attention earlier than do those with the more insidious form of hyperthyroidism accompanying adenomatous goiter. Therefore, more opportunity for precipitating diabetes is given by adenomatous goiter with hyperthyroidism. Owing to the uncertain onset of each disease and to the fact that certain symptoms (bulimia, loss of weight and weakness) are common to the two conditions, satisfactory conclusions frequently could not be reached as to the priority in the appearance of the two diseases. That the hyperthyroidism preceded in many cases is, however, quite clear. Nineteen of the sixty-one patients were encountered in a series of 1,132 patients with exophthalmic goiter seen at the clinic from 1935 to 1937 inclusive and forty-two among 750 patients who had adenomatous goiter with hyperthyroidism. In the latter group hyperthyroidism was a factor of etiologic significance in the precipitation of the diabetes. A follow-up of Wilder's thirty-eight patients who had hyperthyroidism with diabetes shows that when those who did not have thyroidectomy are excluded the average duration of life after the onset of diabetes was 12.4 years. The data support the assumption that patients with hyperthyroidism and diabetes who receive satisfactory surgical treatment for their hyperthyroidism do as well as patients with diabetes alone, whereas those who are not relieved by operation fare badly.

Cholesterol Esters of Blood in Hepatic Disease.—Greene and his associates determined the clinical value of the ratio of combined to total cholesterol in the blood of 645 patients with possible disease of the liver or of the extrahepatic biliary tract. After the routine total and combined cholesterol determinations, icteric index and van den Bergh test on each patient and an adequate follow-up period, 598 of the 645 patients were found to have no apparent hepatic damage. The normal range of total cholesterol was found to be from 150 to 230 mg. per hundred cubic centimeters and that of the esters from 60 to 120 mg. The ratio of combined to total cholesterol was 46 per cent plus or minus 6. One hundred and fifty-four determinations of the total cholesterol and of the cholesterol esters in the blood were made on the forty-seven patients with proved hepatic disease or biliary obstruction of hepatic origin. The results showed that there was a marked "shift to the left" of the values for patients with hepatic disease. The thirty-one patients with hepatic disease showed the greatest decreases in esters. The esters were not definitely decreased in the sixteen patients with obstructive jaundice, although the ratio had a tendency to be lower than the 40 per cent determined as the lower normal limit. There was a general increase of total cholesterol in the blood of patients with obstructive jaundice, but in hepatic disease the cholesterol esters tended to disappear from the blood regardless of the behavior of the total cholesterol. A progressive decrease in the values for the combined cholesterol of the blood signifies a poor prognosis and vice versa. The combined cholesterol determination is of great value in determining the prognosis after surgical intervention for disease of the biliary tract.

Hemorrhagic Purpura Following Treatment with Arsenicals.—Since 1936, Falconer and Epstein have encountered six patients with hemorrhagic purpura following treatment with arsphenamine derivatives. Five of the patients showed typical hemorrhagic purpura following the use of neoarsphenamine or of bismarsen but had no apparent reaction following the intravenous injection of mapharsen. The sixth patient showed large ecchymotic areas in the skin but no thrombopenia following the administration of bismarsen and neoarsphenamine. The authors believe that the condition is of much more frequent occurrence than published reports would indicate. Seven of the eight patients (two reported in 1936) have been tested for tolerance to mapharsen, and none have shown any untoward reaction or any evidence of hemorrhagic purpura following its use. Varying degrees of shock occurred after test doses of arsphenamine to which five of the patients of the present series were sensitive. This suggests that the reaction was an allergic phenomenon rather than one due to the toxic effects of oxidation or to a changed chemical form of the drug injected. The prompt loss of circulatory tone accompanying the reaction appears to be a vasomotor effect, with loss of capillary tonus, dilatation of the capillary bed and a rapid loss of platelets from the general

circulation. It is difficult to believe that such enormous numbers of platelets could be destroyed within fifteen minutes after the drug was injected. The fact that a great number of platelets were returned promptly into the general circulation by the injection of 1 cc. of epinephrine hydrochloride (1:1,000 solution) and that the count rose within twenty-four to forty-eight hours after the reaction is evidence against the assumption of widespread destruction of the platelets. Blood cells other than the platelets showed little if any change. There appeared to be a tendency to an increase of the polymorphonuclear cells following a reaction, particularly a severe reaction. This may well be a phenomenon similar to the leukocytosis associated with protein shock.

Archives of Pathology, Chicago

29:741-892 (June) 1940

Experimentally Induced Benignancy of Neoplasm: IV. Suppression of Mitotic Activity by So-Called Immunization. A. M. Brues and W. T. Salter, Boston.—p. 741.
Alveolar Lining of Lung in Relation to Viability of Fetus. Mary Zeldes, Chicago.—p. 748.
Golgi Apparatus of Thyroid Gland. C. S. Welch and A. C. Broders, Rochester, Minn.—p. 759.
Chemotactic Properties of Tuberculophosphatide and Tuberculopolysaccharide. W. B. Wartman and E. S. Ingraham Jr., Cleveland.—p. 773.
Histologic Changes in Renal Arterioles of Hypertensive Rabbits. F. W. Dunihue and B. H. Candon, Burlington, Vt.—p. 777.
Effects of Thyroid and Calcium Therapy on Growth of Sarcoma Transplants in Thyroparathyroidectomized Rats. R. L. Ferguson, R. D. Templeton, Mary C. Patras and F. A. McJunkin, Chicago.—p. 785.
Experimental Gastric Carcinoma: Critical Review with Comments on Criteria of Induced Malignancy. A. J. Klein and W. L. Palmer, Chicago.—p. 814.

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Adrenal Insufficiency. R. F. Loeb, New York.—p. 347.
The Cushing Syndrome: Neoplasms of Adrenal Gland. S. Silver, New York.—p. 368.
Surgical Considerations in Treatment of Chronic Lymphedema and of Varicose Veins. G. H. Pratt, New York.—p. 381.
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Allergy in Childhood. L. W. Hill, Boston.—p. 395.
Analysis of Maternal Deaths and Hospital Obstetric Statistics in New York County. M. Schneider, T. J. Duffield and Sylvia L. Parker, New York.—p. 404.

Canadian Medical Association Journal, Montreal

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Fractures of Mandible. S. Gordon, Toronto.—p. 521.
Skin Test for Susceptibility to Pertussis. L. P. Strean, Montreal.—p. 525.
Granuloma Pyogenicum: Report of Four Cases Treated by Roentgen Rays. D. Eisen, Toronto.—p. 528.
Unilateral Multilocular Cystic Kidney: Report of Case in Young Child. W. A. Dakin, Regina, Sask.—p. 531.
Treatment of Gonorrhea by Chemotherapy: Preliminary Note. D. R. Mitchell, C. H. Greig and J. L. Uren, Toronto.—p. 533.
Backache: Relation of Physical Therapy to Its Management. F. H. Krusen, Rochester, Minn.—p. 534.
*Hemorrhagic Tendency Associated with Prothrombin Deficiency and Its Treatment with Vitamin K and Bile. S. R. Townsend and E. S. Mills, Montreal.—p. 541.
Relative Merits of Intravenous and Retrograde Urograms. G. S. Foulds and E. H. Shannon, Toronto.—p. 547.
Effect of Reducing Diets on Eye: A Public Health Problem. W. Thau, Boston.—p. 550.
Survey of Ophthalmic Conditions Among Rural School Children. J. V. V. Nicholls, Montreal.—p. 553.
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Recognition of Late Toxemia of Pregnancy in Its Incipience. H. F. Dyer, Hamilton, Ont.—p. 565.
Hysterosalpingography in Diagnosis of Gynecologic Affections. J. E. Gendreau and O. Dufresne, Montreal.—p. 567.
Appendicitis. R. M. Wansbrough, Toronto.—p. 568.
Treatment of Carcinoma of Colon. R. V. B. Shier, Toronto.—p. 570.

Vitamin K and Bile for Hemorrhagic Tendency.—Townsend and Mills compare the results in eighteen cases of jaundice in which treatment with vitamin K was not given with those of seventeen in which vitamin K and bile were given and three in which synthetic vitamin K preparations were given. There were three deaths from hemorrhage in the untreated group as compared to no fatalities in the other group. Three of the twenty treated patients bled postoperatively. Vitamin K and bile therapy resulted in a prompt beneficial effect. None of the patients bled before operation. Many of the disturbances in prothrombin time were considerably prolonged but were restored to normal with adequate vitamin K treatment. The oral administration of 3,000 units (approximately 90,000 Dam units) of vitamin K daily with from 2 to 3 Gm. of desiccated whole fresh bile is sufficient to reduce the prothrombin time to normal in three days. Smaller dosage requires a longer time and conversely larger dosage a shorter interval to produce a comparable result. The authors' experience with synthetic vitamin K indicates that these substances may prove more potent than the original vitamin K preparations from alfalfa, and that this new therapy will replace the early type of treatment. In the three cases studied there were no local reactions or toxic effects. Blood studies revealed no evidence of a hemolytic anemia, but this complication should be kept in mind until more is known of the action of these substances in man. Cases were treated effectively by both the oral and parenteral methods. The latter has the advantage of being effective without bile and is uninfluenced by factors affecting absorption from the gastrointestinal tract. From 1 to 2 mg. of the synthetic vitamin K substitutes daily have proved effective. Treatment was equally effective in other conditions associated with prothrombin deficiency, such as gastrointestinal lesions without jaundice, and in cases in which infection seemed to be the only factor. No definite relationship was found between the degree of disturbance of the prothrombin time and the duration or intensity of the jaundice. This was considered to be due to the fact that many cases did not show complete obstruction as indicated by the low values of the plasma bilirubin.

Georgia Medical Association Journal, Atlanta

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Reminiscences of a Georgia Pediatrician. S. A. Visanska, Atlanta.—p. 295.
Two Case Reports of Interest from the Diagnostic Standpoint. P. S. Kemp, Macon.—p. 321.

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Pollinosis: From Standpoint of Preventive Medicine and Public Health. R. V. Ellis, Minneapolis.—p. 253.
Bowel Obstruction at Birth. E. M. Miller, Chicago.—p. 258.
Care of Severe Injuries of Face and Jaws. J. B. Brown and F. McDowell, St. Louis.—p. 260.
Intra-Ocular Malignancies. W. H. Fink, Minneapolis.—p. 268.
Interrelationships of Health and Physical Education. J. E. Raycroft, Princeton, N. J.—p. 270.
Paranasal Sinusitis: Factors in Management and Prognosis. F. L. Bryant, Minneapolis.—p. 273.
Relationship of Physical Education to Health Service. L. C. Boles, Wooster, Ohio.—p. 278.
Tuberculosis in Nursemaids. D. V. Sharp, Minneapolis,—p. 280.
Abscesses of Neck: Case Reports. H. P. Rosenberger, Bismarck, N. D.—p. 281.

Journal of Pediatrics, St. Louis

16:679-828 (June) 1940

Intravenous Administration of Small Doses of Casein Hydrolysate to Nephrotic Children and Its Effect on Nitrogen Balance and Plasma Amino Acid Level. L. E. Farr, New York.—p. 679.
Acacia Therapy in Child with Nephrosis. Dorothy F. Falkenstein and R. L. Jackson, Iowa City.—p. 700.
Synthesized, Processed and Natural Sources of Vitamin C in Mineral Metabolism of Normal Children. Marion L. Shepherd, Icie G. Macy, Helen A. Hunschcer and Frances Cope Hummel, with assistance of Mary Bates Olson, Priscilla Bonner, J. Horton, A. Theresa Johnston and Louise Emerson, Detroit.—p. 704.
*Survey of State of Nutrition with Respect to Vitamin C in a Southern Pediatric Clinic. Ann S. Minot, Katharine Dodd, Margaret Keller and Helen Frank, Nashville, Tenn.—p. 717.
Some Responses of Child to Exercise. F. W. Schlutz, Minerva Morse and J. L. Gedgoud, Chicago.—p. 729.
Congenital Arteriovenous Fistulas in Children. C. E. Ward and B. T. Horton, Rochester, Minn.—p. 746.
Tonic Neck Reflex in Newborn Infants. Julia Mehlman, New York.—p. 767.
Thyroid Therapy in Juvenile Myxedema. L. G. Rowntree, Philadelphia.—p. 770.
Environmental and Personality Problems in Treatment of Diabetic Children. H. F. Shirley, San Francisco, and Ina May Greer, Iowa City.—p. 775.

Nutrition and Vitamin C.—Minot and her associates estimated the ascorbic acid in the blood serum of 533 children who came to the pediatric clinic for immunization, routine examination or specific treatment. The group consisted of 380 children with no serious complaint or disease, 105 sick children without

diarrhea and forty-eight sick children with diarrhea as the chief complaint. The data obtained in the first or normal group of children was subdivided into observations made from February 1 to June 1 and from June 1 to October 1, when fresh vegetables and fruits were more plentiful. The data show that there is considerable undernutrition with respect to vitamin C among the clinic group in this locality. During the months in which fresh fruit and vegetables are scarce, about 60 per cent of the children had levels of ascorbic acid below the generally accepted satisfactory level of 0.7 mg. per hundred cubic centimeters of serum and about 30 or 40 per cent less than 0.3 mg. During the months when fruit and vegetables are plentiful and cheap there was an obvious shift in distribution in older children. A considerably larger percentage reached a satisfactory level. Only about 10 per cent still gave evidence of gross undernutrition with respect to vitamin C. The seasonal variation was slight in children less than 3 years of age. Many more of the 105 sick than the normal children had frankly low levels of ascorbic acid in the serum. The highest percentage (62.5) of values below 0.3 mg. was found in the younger age group as against 31.2 per cent of children from 3 to 15 years of age. No particular disease influenced the level of vitamin C. The general trend to lower concentrations of ascorbic acid in the serum in the presence of disease indicates that special efforts are necessary if normal concentrations are to be maintained in sick children, especially if ascorbic acid plays the indispensable part it is believed to assume in normal biologic processes. All but three of the forty-eight sick children with diarrhea as the chief complaint were hospitalized and all except four were less than 3 years of age. The percentage of values less than 0.3 mg. of ascorbic acid per hundred cubic centimeters was essentially the same as in sick children less than 3 years of age without diarrhea. Failure to take food and poor absorption probably are more important factors in causing the low levels in the children with diarrhea. From 10 to 20 mg. per kilogram of ascorbic acid for one week or longer was frequently inadequate to restore or to maintain a satisfactory level of ascorbic acid in the serum of young children with severe diarrhea. The same doses usually suffice to restore the level in normal children of similar age. Whatever the cause of the deficiency, it is again apparent that young sick children with or without diarrhea are frequently deficient in vitamin C unless the extra required amount is supplied. The authors conclude that it is still not known why clinical evidence of scurvy is so seldom seen among the rather large group which is apparently grossly deficient in vitamin C. They suggest that diets which are simultaneously deficient in calories and other essential factors may suppress the typical manifestations of the deficiency but that in otherwise adequately nourished persons such diets would cause outspoken scurvy.

Journal of Pharmacology & Exper. Therap., Baltimore

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Circulatory Effects of Venom of the Indian Cobra (Naia Naia). F. Gottdenker, São Paulo, Brazil, and M. Wachstein, New York.—p. 117.
Relation of Atropine to Adrenalin and Sympathetic System. L. J. Bussell, Oxford, England.—p. 128.
Clinical Experiences with Some Curare Preparations and Curare Substitutes. M. S. Burman, New York.—p. 143.
In Vitro Action of Certain Sulfanilamide Derivatives on PR-8 Strain of Influenza Virus. D. R. Climenko, Bound Brook, N. J.—p. 165.
Comparative Therapeutic Activity of Sulfanilamide, Sulfapyridine, Sulfathiazole and Diaminosulfone in Type I Pneumococcus Infections in Mice. J. T. Litchfield Jr., H. J. White and E. K. Marshall Jr., Baltimore.—p. 166.

Kentucky Medical Journal, Bowling Green

38:231-278 (June) 1940

Pituitary Adenoma and X-Ray Therapy of the Disease. H. Newman, Bowling Green.—p. 232.
Resistant, Recurrent and Metastatic Carcinoma. D. Y. Keith, Louisville.—p. 235.
Prolapsus Uteri. M. Casper, Louisville.—p. 240.
Historical Research. K. W. Rawlings.—p. 242.
Psychotherapy. S. Ackerly, Louisville.—p. 251.
The Army Medical Library of Washington and Its Collection of Early Kentuckiana. E. E. Hume, Washington, D. C.—p. 258.
Review of Acute and Chronic Arthritis. T. A. Griffith, Mount Vernon.—p. 268.
Intra-Uterine Skull Fracture. G. F. Jones and W. L. O'Nan, Henderson.—p. 273.

Maine Medical Association Journal, Portland

31:151-190 (June) 1940

Benign Gastric Tumor: Report of Two Cases. I. M. Webber and W. D. Anderson, Portland.—p. 151.
Bingham Hospital Extension Services. J. Gottlieb, Lewiston.—p. 155.
Graduate Education in Medicine. F. T. Hill, Waterville.—p. 159.
Of Making Many Books. R. Bliss, Bluehill.—p. 162.

Michigan State Medical Society Journal, Lansing

39:373-452 (June) 1940

Hygiene of Infants and Children. R. M. Smith, Boston.—p. 391.
Occiput Posterior: Incidence, Significance and Management. L. A. Calkins, Kansas City, Kan.—p. 396.
Arthritis: Acute Gonococcic and Gouty. R. H. Freyberg, C. J. Smyth, W. D. Block and W. S. Preston, Ann Arbor, Mich.—p. 402.
Lesions of Mouth. A. R. Woodburne, Detroit.—p. 407.
Biliary Tract Disease: Surgical Management. G. K. Glasgow and G. D. Livingston, Detroit.—p. 411.

Military Surgeon, Washington, D. C.

86:529-624 (June) 1940. **Partial Index**

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Peace Time Training to Meet Mobilization Needs. L. C. Fairbank.—p. 539.
Eosinophilic (Acidophilic) Bodies in Common Cold. H. H. Parsons.—p. 543.
Sulfapyridine Therapy in Pneumonia. H. P. Marvin, A. L. Bradford and W. H. Ketchum.—p. 554.
Long Distance Transportation of Wounded by Air at High Altitudes. H. Kowalzig.—p. 565.
Modern Anesthesia for War Surgery. G. E. Donaghy.—p. 577.
Causes of Failure in Physical Examination for Flying as Seen in Cadet Applicants. C. L. Leedham.—p. 583.
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Hints About Marching Feet. H. Hansen.—p. 592.
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Postmobilization Chest Survey. W. C. Pollock.—p. 596.

Minnesota Medicine, St. Paul

23:383-458 (June) 1940

Organized Medicine and Industrial Health. C. M. Peterson, Chicago.—p. 383.
Defense of Insanity in Criminal Cases. J. A. Garrity, Moorhead.—p. 387.
Extension of Group Hospital Service. A. M. Calvin, St. Paul.—p. 391.
Survey of Health Activities and Problems Among Former University Students. C. J. Potthoff and C. R. Pace, Minneapolis.—p. 397.
Eye Defects Causing Loss of Vision. W. H. Fink, Minneapolis.—p. 400.
Prenatal Care and Its Relation to Late Toxemias. A. G. Schulze, St. Paul.—p. 406.
Sulfathiazole in Otolaryngology. B. G. Levin, St. Paul.—p. 410.
*Significance of Inhalant Allergens in Treatment of Bronchial Asthma of the Child. A. V. Stoesser, Minneapolis.—p. 413.
Ewing's Tumor (Hemangio-Endothelioma: Endothelial Myeloma: Solitary Diffuse Endothelioma): Problem in Differential Diagnosis. H. W. Meyerding and G. A. Pollock, Rochester.—p. 416.
Rat Mite Dermatitis in Minnesota. W. A. Riley, Minneapolis.—p. 423.

Inhalant Allergens and Bronchial Asthma of Children.—In a study of 329 children with bronchial asthma Stoesser found that, in 252 foods, inhalants and pollens were the causative factors. Fifty-eight children had attacks of asthma associated with infections of the upper part of the respiratory tract. Because tonsillitis occurred frequently in this group, the tonsils and adenoids were removed and thirty-eight obtained definite relief. The remaining twenty were not helped and a few of them were made worse by the operative procedures. The asthmatic attacks of ten children whose tonsils and adenoids had been removed many years before the attacks occurred were based on chronic infections of the respiratory system. Nine children failed to respond to any form of treatment except the use of potassium iodide. This preparation produced a more or less specific result. The inhalant group of allergens exclusive of the pollens was the cause of asthma among 122 children. House dust, feathers and cottonseed were the most important inhalants. Hyposensitization therapy for the inhalant allergy did not give encouraging results. The children sensitive to house dust were difficult to treat because this inhalant could be reduced but not completely removed from the environment. The cases sensitive to feathers responded well to the thorough removal of the inhalant. At first the children sensitive to cottonseed presented a difficult problem, but with the reduction or elimination of the linter dust from the environment good results were obtained. Some of the articles of furniture containing linter cotton were replaced by special mattresses and cushions

made of materials considered to be very weak allergens. The patients sensitive to animal emanations and some of the other inhalants were easily taken care of by more or less routine measures. The only exception was sensitivity to fish glue. The children sensitive to this allergen required hyposensitization therapy and the results were fairly good. Sudden changes in the weather did have some influence on the asthma, especially among children sensitive to house dust.

Missouri State Medical Assn. Journal, St. Louis

37:233-266 (June) 1940

The Challenge Accepted. J. R. McVay, Kansas City.—p. 233.
The Responsibility of Medical Care. C. E. Burford, St. Louis.—p. 235.
Cerebral Syndrome. L. B. Alford, St. Louis.—p. 236.
Backache During Pregnancy and Its Management. E. Lissack, Concordia.—p. 238.
Hay Fever: Value of Daily Atmospheric Counts of Pollen Grains and Mold Spores in Diagnosis and Treatment. F. K. Hansel, St. Louis.—p. 241.
Allergy and Its Treatment. J. Backlar, Clayton.—p. 246.

Nebraska State Medical Journal, Lincoln

25:205-244 (June) 1940

Organic Heart Disease (Clinic). S. A. Levine, Boston.—p. 209.
Surgical Diagnosis: Practical Concepts. R. H. Whitham, Lincoln.—p. 213.
Principles of Reconstruction in Ankle Malunion. W. R. Hamsa, Omaha.—p. 218.
Menus, Diets and Nutrition. M. J. Breuer, Lincoln.—p. 222.
Early Recognition of Suicidal Tendencies. H. A. Wigton, Omaha.—p. 226.
Prostatic Hypertrophy versus Neurogenic (Cord) Bladder: Differential Diagnosis. P. Adams, Omaha.—p. 229.
Urinary Calculi (Urolithiasis). C. W. Mason, Omaha.—p. 232.

New Jersey Medical Society Journal, Trenton

37:295-346 (June) 1940

*Pulmonary Abscess: Report of Forty-One Cases. P. Geary, Plainfield.—p. 297.
Vasomotor Regulation of Temperatures of Extremities in Health and Disease. B. T. Horton, C. Sheard and Grace M. Roth, Rochester, Minn.—p. 311.
Duties of a President of a County Society. R. A. Schaaf, Newark.—p. 323.

Pulmonary Abscess.—Geary treated forty-one patients who had the nontuberculous type of pulmonary abscess. Twenty-eight were males and thirteen females. There were three cases in the first decade, five in the second, fourteen in the third, four in the fourth, eleven in the fifth and four in the sixth. Removal of the tonsils and adenoids was the procedure in 27 per cent. Next to aspiration in etiologic importance is pneumonia. The lesion is caused by an infected nidus with a surrounding inflammation and edema which eventually localizes. Subsequently liquefaction of the devitalized center is produced by saprophytic organisms. The various organisms (fusiform bacilli, spirilla, streptococci, staphylococci, fungi and the like) are those which normally exist in the mouth in a more or less dormant form. Pulmonary abscess is usually solitary. The patient complains of pain in the chest, chills, prostration, fever and often cough, which in the beginning is nonproductive. These symptoms continue with little change for from a few days to three weeks, when expectoration and severe cough begin. The breath is pungent. When expectoration of foul material begins, a large quantity of sputum may be expectorated over a short period indicating that the abscess has broken into a bronchus and the process of liquefaction is well established. Because the sputum is blood tinged and the symptoms differ from pneumonia, pulmonary tuberculosis is often suspected. However, foul sputum is rare in uncomplicated tuberculosis and the onset does not overwhelm the patient as quickly as the acute pulmonary abscess. A chronic pulmonary abscess would have a mortality of more than 90 per cent if it were left untreated. Aspiration through the chest wall should never be done. Since early treatment is desirable, the following conditions should suggest pulmonary abscess: (1) a pulmonary complication following any operation, delivery, operative manipulation, general anesthesia or localized infective process, (2) thick foul sputum, in the absence of a history of chronic bronchiectasis, and (3) foul sputum, coupled with x-ray evidence of a solitary abscess shown by a fluid level in which the whole lesion is circumscribed. The most important phase of treatment is prophylactic. Bronchoscopy is of great value in removing secretion and in detecting and removing foreign bodies causing lung abscess and it may localize the site of the purulent secretion. Bronchoscopy, postural drainage, bed rest and other conservative measures are indicated in the early stages. If it is evident from roentgenograms taken at weekly intervals that the condition is stationary or getting worse, operative intervention should not be delayed even though the patient seems to be improving clinically. If a lesion is localized and improvement is doubtful after two or three weeks of conservative treatment, operative drainage is indicated. Doubt may exist for several months more, by which time the abscess becomes chronic and the operation is less likely to be successful and the convalescence prolonged. If the tissues are indurated and there is no motion between the pleural layers the procedure can be performed in one stage. If doubt exists, the operation is done in two stages, the wound packed with plain gauze and left wide open. The author used conservative measures in the treatment of seventeen patients with four deaths, or a mortality of 23 per cent. Twenty-four patients were operated on, six of whom died, giving a mortality of 25 per cent. The patients subjected to operation were more seriously ill than the others and had already had conservative therapy.

New York State Journal of Medicine, New York

40:909-982 (June 15) 1940

Globin Insulin: Clinical Study. G. B. Andrews and W. A. Groat, with assistance of Alice V. Wood and M. L. Jones, Syracuse.—p. 913.
Management of Varicose Veins in Private Practice. I. A. Brunstein, New York.—p. 918.
Practical Value of Endometrial Biopsies. D. R. Mishell, Newark, N. J., and L. Motyloff, New York.—p. 928.
Sectional Radiography in Diagnosis of Interesting Thoracic Problems. G. J. Plehn and R. B. Hoenig, New York.—p. 932.

Radiology, Syracuse, N. Y.

34:651-782 (June) 1940

Roentgenologic Differential Diagnosis Between Cancer and Diverticulitis of Colon. R. Schatzki, Boston.—p. 651.
Hematologic Diagnosis and Roentgenologic Treatment of Myelogenous Leukemia. W. C. Popp and C. H. Watkins, Rochester, Minn.—p. 663.
Brief Observation on Erythrocyte Sedimentation in Relation to Irradiated Malignant Tumors. M. F. Madrazo, Mexico City, Mexico.—p. 668.
Fate of Cranial Defects Secondary to Fracture and Surgery: Follow-Up Study of 150 Patients. M. A. Glaser and E. S. Blaine, Los Angeles.—p. 671.
Duodenal Ulcer in Presence of Gallbladder Symptomatology. E. J. Ryan, New York.—p. 685.
Milliammeter Inaccuracy Caused by Control Cabinet. M. M. D. Williams, Rochester, Minn.—p. 691.
Congenital Cystic Malformation of Lungs, Formerly Known as "Vesicular" or "Hypertrophic Pulmonary Emphysema," Recently Described as "Congenital Cystic Disease of Lungs": Report of Case. C. T. Sharpe, New York.—p. 692.
*Cavitary Bronchogenic Carcinoma. H. Hauser and S. E. Wolpaw, Cleveland.—p. 698.
Primary Sarcoma of Stomach: Report of Three Cases. L. K. Chont, Oklahoma City.—p. 714.
Responses of Drosophila Pupae to X-Rays. P. S. Henshaw and I. M. Golomb, New York.—p. 721.
Roentgenographic Unsharpness of Shadow of a Moving Object: II. S. R. Warren Jr., Philadelphia.—p. 731.

Cavitary Bronchogenic Carcinoma.—According to Hauser and Wolpaw, cavitation occurs in all types of bronchogenic carcinoma but most frequently in the squamous cell variety. Fifteen instances of cavitation were demonstrated in an x-ray study of 127 cases of primary bronchogenic carcinoma admitted to Cleveland City Hospital from 1927 to 1937 inclusive. The diagnosis was proved by necropsy or by bronchoscopic or operative biopsy. The ages of the patients varied from 42 to 68 years. Their histories failed to reveal a clinical picture pathognomonic of a cavitary bronchogenic carcinoma. The important symptoms (cough, expectoration, weight loss and weakness) are also common to tuberculosis and lung abscess. Irregular fever above 99.5 F. was present at some time during the course of the illness of thirteen patients. Hemoptysis occurred in twelve and pain was present in ten. Five patients had clubbing of the fingers. The onset of the illness of the fifteen patients was insidious, with an irritative cough as the initial symptom. The cough was nonproductive in eight for from three to eight months. This latent period before expectoration ensues is of value in the differentiation from lung abscess, as patients with the latter lesion rarely remain sputum free for this length of time. In

contrast to pulmonary abscess, foul expectoration was observed in only two cases. Pain was common, appeared early, and was constant, severe and nonpleuritic in type. Such pain which fails to respond to medication is unusual in abscess and pulmonary tuberculosis and should suggest carcinoma. Decreased breath sounds and voice sounds in the involved area, indicating the presence of some degree of bronchial obstruction, were present. However, similar signs accompanied by rales and impairment of the percussion note may also occur in abscess and tuberculosis. Nevertheless, in the presence of x-ray evidence of cavitation, diminished or absent breath sounds should suggest an underlying carcinoma. Horner's syndrome, obstruction to mediastinal blood vessels, vocal cord paralysis, and lymph node and subcutaneous metastases are also suggestive. However, as cavitary bronchogenic carcinomas are usually of the squamous cell variety, extrathoracic metastases will not be frequent. At the time of admission to the hospital the patients presented a chronic, steadily progressive illness in its terminal stages. Eleven of them died within two months of admission. The total duration of life of ten from onset of symptoms was less than one year. One patient lived twenty months after the initial symptoms. X-ray signs in cavitary bronchogenic carcinoma include all features observed in other types of cancer of the bronchus, with the addition of cavitation. Signs of atelectasis are more often absent than present. The location of the tumor is variable. If extensive the cavity may involve more than one lobe, especially if it originates in the base of either upper lobe. The lesion is often difficult to demonstrate in the postero-anterior view, and lateral or oblique projection is often required. The average size of the cavity among the fifteen patients was 5.2 cm.; the smallest was 1.5 cm. and the largest 14 cm. Enlarged lymph nodes may be present in the hilus as a result of regional metastasis. The cavity simulates that found in pulmonary abscess and gangrene, tuberculosis or bronchiectasis. In the presence of a cavitary lesion of the lung, x-ray evidence of metastasis in the bones, brain or other soft tissues may aid in establishing the diagnosis. Bronchograms, by demonstrating filling defects or occlusion of the lumen of the bronchus leading to the cavity, will give the clue to the diagnosis of neoplasm.

Rhode Island Medical Journal, Providence

23:75-108 (June) 1940

Gastroscopy and Clinical Medicine. R. S. Bray, Providence.—p. 75.
Brain Abscess with Brain Potentials. C. A. McDonald and M. Korb, Providence.—p. 81.
Causation of Postoperative Distention. W. P. Davis, Providence.—p. 85.
Diagnosis of Intestinal Obstruction. E. A. Shaw, Providence.—p. 87.
Treatment of Postoperative Distention. H. B. Moor, Providence.—p. 90.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

48:333-402 (June) 1940

Vascular Lesions of the Extremities. P. G. Flothow, Seattle.—p. 333.
Vernix Caseosa: Manifestation of Vitamin A Deficiency: Preliminary Report. J. V. Straumfjord, Astoria, Ore.—p. 341.
Present Status of Vitamin K. C. P. Larson, Tacoma, Wash.—p. 352.
Cholecystostomy Following Cholecystostomy: Report of Procedure and Twelve Cases. A. Laubersheimer, Los Angeles.—p. 357.

West Virginia Medical Journal, Charleston

36:241-288 (June) 1940

Hypothyroidism. H. H. Golz, Clarksburg.—p. 241.
Diagnosis and Treatment of Atypical Lymphoblastoma. H. W. Jacox, Pittsburgh.—p. 249.
Selection of Items for a Public Health Program. J. W. Mountin, Washington, D. C.—p. 253.
Granulocytopenia: Case Treated with Adenine Sulfate. F. J. Holroyd, Princeton.—p. 261.
Liver Function and Carbohydrate Metabolism. J. S. Pearson, Huntington.—p. 263.
New Viscera Retractor. H. C. Myers, Philippi.—p. 268.
Blood Smear in Diagnosis. W. L. Claiborne, Huntington.—p. 270.
Malignant Tumor of Kidney: Report of Case. T. J. McBee and C. C. Fenton, Morgantown.—p. 272.

Wisconsin Medical Journal, Madison

39:413-500 (June) 1940

Low Back Pain: I. Anatomic Aspect. E. J. Carey, Milwaukee.—p. 427.
Id.: II. Medical Aspect. G. H. Coleman, Chicago.—p. 446.
Id.: III. Urologic Aspect. H. Culver, Chicago.—p. 450.
Id.: IV. Gynecologic Aspect. E. Cary, Chicago.—p. 456.
Id.: V. Orthopedic Aspect. E. W. Ryerson, Chicago.—p. 459.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

52:173-204 (June) 1940

Pili Torti, with Discussion of Molecular Structure of Condition and Its Relationship to Monilethrix: Clinical Description, X-Ray and Optical Examination; Case. F. F. Hellier, W. T. Astbury and Florence O. Bell.—p. 173.
Sudden Death in Infantile Eczema. J. H. T. Davies.—p. 182.
Some Observations on Intracutaneous Reactions in Allergic Eczemas. H. Haxthausen.—p. 191.

British Medical Journal, London

1:879-918 (June 1) 1940

Mass Radiography, with Special Reference to Screen Photography and Pulmonary Tuberculosis. F. J. Bentley and Z. A. Leitner.—p. 879.
Traumatic Extradural Hemorrhage. A. R. Short and Marjorie Dunster.—p. 884.
Peripheral Gangrene of Unknown Origin: Two Cases. R. Marshall.—p. 886.
Panic States in Civilians. H. Stalker.—p. 887.
Vitamin E and Habitual Abortion. A. L. Bacharach.—p. 890.

Edinburgh Medical Journal

47:369-440 (June) 1940

*Thrush, with Special Reference to Vaginal Thrush. W. G. Liston and L. G. Cruickshank.—p. 369.
Pathology of Speech and Voice. D. Guthrie.—p. 391.
Use of Estrogens in Obstetrics and Gynecology. A. I. S. Macpherson.—p. 406.
Some Aspects of Malnutrition Problem. J. P. McGowan.—p. 425.

Vaginal Thrush.—Liston and Cruickshank found forty-nine out of 200 pregnant women with leukorrhea to be suffering from vaginal thrush. Next to trichomoniasis (40 per cent) vaginal thrush was the second most important cause of leukorrhea. This vaginal infection may be communicated to the babies and in some institutions it has given rise to severe epidemics associated with fatalities not always recognized as due to thrush but attributed to diarrhea, bronchitis and bronchopneumonia. The authors' examination of the patient consisted in interrogating the patient, inspecting the vulva and vagina, the making of films on slides for microscopic examination, washing out the vagina with sterile saline solution at a p_H of 7 and collecting this in Liston's vaginal sampling pipet for the purpose of determining the p_H of the vaginal contents and, roughly, the amount of glycogen present in the epithelial cells. The parasite can be recognized and the disease diagnosed by examining under a low power lens material obtained directly from the lesions in which microscopic portions of the septate pseudomycelium together with blastospores are found. The disease should be sought for and treated ante partum lest the baby become infected. The infection may be overlooked unless the parasite is sought. The symptoms in some cases may be trivial. The presence of the parasite in the vagina seems to depend on the p_H reaction of the vaginal contents. The mean p_H reading found on the examination of thirty-two of the cases was 4.8. The mean p_H reading of twenty-seven normal pregnant women was 4.4 and of thirty-four pregnant women infected with Trichomonas vaginalis it was 5.5. The authors attach great importance to the p_H reaction of the vaginal contents as a factor encouraging or inhibiting the development of vaginal thrush.

Journal of Endocrinology, London

2:1-140 (May) 1940. **Partial Index**

Method of Assay for Progesterone Based on Inhibition of Uterine Estrus. A. J. Szarka.—p. 1.
Mechanism of Action of Gonadotropin from Pregnancy Urine. B. Zondek.—p. 12.
Morphologic Relationship Between Testicular Nerves and Leydig Cells in Man. H. Okkels and K. Sand.—p. 38.
Metabolism of Parent Compounds of Some Simpler Synthetic Estrogenic Hydrocarbons. S. W. Stroud.—p. 55.
Excretion of Free Estrogen During Uterine Bleeding. A. Palmer.—p. 70.
Isolation of Estrone from Ox Adrenals. D. Beall.—p. 81.
17-Ketosteroid, Androgen and Estrogen Excretion in Urine of Cases of Gonadal or Adrenal Cortical Deficiency. N. H. Callow, R. K. Callow and C. W. Emmens.—p. 88.
Rate of Loss of Activity of Antigonadotropic Serum in Vivo. M. R. A. Chance.—p. 99.
Excretion of Estrogen and Pregnandiol by Pregnant and Parturient Women: Normal and Toxemic Cases. A. M. Hain.—p. 104.

Journal of Laryngology and Otology, London

55:197-236 (April) 1940

Nasal Osteomas. A. S. Handousa.—p. 197.
Importance of Biologic and Endocrinologic Factors in Otorhinolaryngology: Report Delivered at the Annual Meeting of the Otolaryngologic Society in Odessa. A. Geschelin.—p. 212.

Journal of Pathology and Bacteriology, London

50:393-560 (May) 1940. **Partial Index**

Histology of Rat's Liver During Course of Carcinogenesis by Butter-Yellow (*p*-Dimethylaminoazobenzene). J. W. Orr.—p. 393.
Occurrence in Normal Mice of Pleuropneumonia-like Organisms Capable of Producing Pneumonia. D. G. f. Edward.—p. 409.
Chemotherapy of Experimental Staphylococcic Infection in Mice with Drugs of Sulfanilamide Group. P. Browning.—p. 431.
Passive Protection of Mice with Immune Horse Serum Against Living Staphylococci. L. N. Farrell and J. S. Kitching.—p. 439.
First Effects on Mouse Skin of Some Polycyclic Hydrocarbons. B. D. Pullinger.—p. 463.
Postmortem Glycolysis. J. L. Hamilton-Paterson and Elsie W. M. Johnson.—p. 473.
Bactericidal Action of Normal Serums. J. Gordon and K. I. Johnstone.—p. 483.
Endocarditis Due to a New Species of Haemophilus. O. Khairat.—p. 497.
*Cancer of Rectum: Analysis of 1,000 Cases. C. E. Dukes.—p. 527.

Cancer of Rectum.—According to Dukes, of 1,000 patients with rectal cancer removed by radical excision there were 650 men and 350 women. These figures correspond to those reported by the registrar general for 1936, 3,303 deaths in males and 2,083 in females, giving a ratio per thousand of 613:387. The mean age of the 350 women was 55.1 and of the 650 men 58.6. The earlier age of onset in women is also brought out by the fact that 11.2 per cent of the women were less than 40 years of age as compared with only 6 per cent of the men. A similar difference is found in the registrar general's figures for England and Wales. A more widespread extension of the disease is likely to be found in young patients. In patients less than 40 years of age, lymphatic metastases were found in 71.8 ± 4.3 per cent, whereas in the group from 40 to 59 years of age they were found only in 50.9 ± 2.4 per cent. This relation of spread and the age of the patient held for both sexes. This might be attributed to delay in receiving surgical treatment or to a more rapid progress of the disease in young patients. The latter appears to be the most likely explanation. At the time of surgical treatment most rectal cancers are oval, extend over two or three quadrants of the rectum and measure from 2 to 3 inches in diameter from above downward. High grade malignant tumors were most frequent in young patients. In about 15 per cent of cases of rectal cancer regarded as operable the growth was still restricted to the rectal wall, in about 35 per cent it had spread by direct continuity into the perirectal fat but had not yet caused lymphatic metastases and in 50 per cent lymphatic metastases were found. Extension of rectal cancer within the lumen of the hemorrhoidal veins was found in approximately 18 per cent of the operative specimens. Usually one malignant growth was found, but associated malignant tumors were fairly common and they may be encountered in multiple primary cancer, secondary malignant tumors and familial intestinal polyposis. Evidence of lymphatic permeation was found in 4.4 ± 3 per cent of grade 1 tumors, 8.6 ± 5.1 per cent in grade 2, 30.1 ± 4.2 per cent in grade 3 and 50 ± 15.8 per cent in grade 4. The respective venous spread was 4.4 ± 3, 12.2 ± 1.8, 36.3 ± 4.5 and in 20 ± 12.7 per cent. These considerations emphasize the importance of the microscopic structure of rectal cancer, since this may allow an estimate to be made of its rate of growth and may even provide an indication of the extent of local, lymphatic or venous spread. In its earliest stage rectal cancer takes the form of a small thickening of the mucous membrane or a hard nodule in a preexisting adenoma or villous papilloma. As the growth increases it gives rise to ulceration. Ulceration usually commences when the growth has spread through the submucosa into the muscle. Deep ulceration indicates that the growth has spread through the muscle into the perirectal tissues. All regions of the rectum may be affected approximately to the same extent, though probably the incidence decreases slightly on passing from the anus toward the pelvic colon.

Journal of Physiology, Cambridge

98:141-262 (May) 1940. **Partial Index**

Permeability of Blood-Aqueous Humor Barrier to Potassium, Sodium and Chloride in Surviving Eye. H. Davson and J. P. Quilliam.—p. 141.
Transmission of Light by Eye Media. K. J. W. Craik.—p. 179.
Effect of Mono-Iodoacetic Acid on Absorption of Water from Glucose Solutions in Subarachnoid Space. T. H. B. Bedford.—p. 185.
Determination of Metabolic Rate of Alcohol. M. Grace Eggleton.—p. 228.
Some Factors Affecting Metabolic Rate of Alcohol. M. Grace Eggleton.—p. 239.
Results of Adrenalectomy in Pregnant Albino Rat. T. McKeown and W. R. Spurrell.—p. 255.

Lancet, London

1:993-1034 (June 1) 1940

Death in the First Month and the First Year. C. McNeil.—p. 993.
Interstitial Emphysema and Pneumothorax After Operations on Neck. H. J. Barrie.—p. 996.
Antiserum and Sulfapyridine in Meningococcic Infections in Mice. C. R. Amies.—p. 999.
Atropine and Ergotoxin as Antidotes to Scorpion Toxin. A. Hassan and A. Hassan Mohammed.—p. 1001.
Autograft of Amputated Digit: Suggested Operation. H. Gillies.—p. 1002.
Concussional and Postconcussional Syndromes. C. T. van Valkenburg.—p. 1003.
Radiologic Demonstration of Adenoids. G. T. Calthrop.—p. 1005.
Purpura Haemorrhagica After Arsenic Therapy Treated with Vitamin P. D. R. Gorrie.—p. 1005.

1:1035-1070 (June 8) 1940

Pulmonary Tuberculosis: Diagnosis and Some Aspects of Treatment. F. G. Chandler.—p. 1035.
Aneurysm of Thoracic Aorta Treated by Wiring with Colt's Apparatus. R. S. Johnson.—p. 1037.
*Sulfathiazole in Bubonic Plague. S. S. Sokhey and B. B. Dikshit.—p. 1040.
Time Relations of Heparin Action on Blood Clotting and Platelet Agglutination. D. Y. Solandt and C. H. Best.—p. 1042.
Pathologic Fracture of Mandible: Nonunion Treated with Pedicled Bone Graft. P. P. Cole.—p. 1044.
Missed Abortion and Missed Labor. T. N. A. Jeffcoate.—p. 1045.
Radium and Radon: Biologic Reactions Compared. S. Russ and G. M. Scott.—p. 1048.

Sulfathiazole in Bubonic Plague.—Sokhey and Dikshit found sulfathiazole to be effective for plague in mice. Sulfapyridine also had some action. In human cases of plague the most important factor which decides the issue is the development of septicemia. Septicemia develops in mice from forty-eight to seventy-two hours after the induction of infection by the subcutaneous route. Therefore the authors started the administration of the drug at four different stages of the infection: at the time the infecting injection was given and twenty-four, forty-eight and seventy-two hours later. Twenty animals were used in each experiment. The mice were observed for at least thirty-one days. Plague organisms were never found in the organ smears and blood cultures of animals dying during the period of administration of the drug, but they were found in animals dying after the drug had been stopped, the only exception being in the experiments in which sulfapyridine was given in 10 mg. doses once a day for ten days. In this case some animals which died during the period of administration of the drug showed the presence of plague organisms. In human plague spontaneous recovery invariably results if the lymph glands prevent the spread of infection to the blood stream and the infection remains localized. The occurrence of such cases in different outbreaks is from 20 to 50 per cent. If the organisms pass the lymph glands and a septicemia results, death invariably follows unless an effective agent can be given to control the infection. The effective agent must be given before extensive destruction of the tissues of the organs has resulted. When the mice were given the drug before septicemia had set in, that is before forty-eight hours after infection, as little as 10 mg. of sulfathiazole twice a day for ten days saved nearly 80 per cent of the infected animals, and even better results were obtained by doubling this dose. Sulfapyridine produced about the same action as sulfathiazole in the early stages of infection with doses of the same order. When the administration of the drugs was started after septicemia had set in, a dose of 20 mg. of sulfathiazole twice a day for ten days cured approximately 80 per cent of infected animals when the drug was given forty-eight hours after infection and 65 per cent when given seventy-two hours after infection. Doubling this dose produced even better results, the survivals becoming 90 and 80 per cent, respec-

tively. These results are as good as those obtained with the Haffkine Institute antiplague serum. It is in this group of animals that sulfathiazole shows much more definite curative action than sulfapyridine. With the largest dose employed (40 mg. twice a day for ten days), when treatment was started forty-eight hours after infection, sulfathiazole cured 90 per cent of infected animals, whereas sulfapyridine cured only 10 per cent. Similar results were obtained when treatment was started seventy-two hours after infection. Since plague is much more severe in the mouse than in man, it is hoped that sulfathiazole will prove even more effective in human infection.

Practitioner, London

144:549-644 (June) 1940

Diagnosis and Treatment of Fractures and Dislocations of Pelvis and Hip Joint. T. P. McMurray.—p. 549.
Common Fractures and Dislocations of Knee and Long Bones of Lower Limb. A. Perry.—p. 559.
Fracture Dislocations of Ankle Joint. R. Broomhead.—p. 571.
Common Fractures and Dislocations of Clavicle and Shoulder Joint. M. G. O'Malley.—p. 579.
Fractures and Dislocations at Elbow. A. Rocyn-Jones.—p. 589.
Fractures and Dislocations of Wrist and Hand. E. L. Farquharson.—p. 598.
Chest Injuries in Modern Warfare. T. H. Sellors.—p. 609.
Some Clinical Problems in Relation to Hemoptysis. P. Ellman.—p. 620.
Modern Therapeutics: XII. Drugs Affecting Control of Vasomotor System. K. D. Wilkinson.—p. 628.

Ginecologia, Turin

6:251-320 (May) 1940. **Partial Index**

*Subcutaneous and Mediastinal Emphysema in Delivery. G. Nicora.—p. 297.
Strangulated Congenital Inguinal Hernia Containing Ovary of Infant Two Months Old. C. Matassi.—p. 316.

Subcutaneous and Mediastinal Emphysema in Delivery.—Nicora reports an unusual case of subcutaneous emphysema of the left side of the neck and face developing in the course of a spontaneous delivery in a syphilitic patient 19 years of age. There was a delayed period of expulsion despite energetic contractions. The placenta was expelled ten minutes after the delivery of a living normal child. The placenta was normal but the umbilical cord was short (38 cm.). Emphysema reached its maximum one hour after the delivery. It remained stationary for the first few days of the normal puerperium and disappeared completely in the course of the next two weeks. There were no subjective symptoms. Roentgenograms of the thorax taken in the anteroposterior and oblique diameters on the third day revealed a subpleural emphysema at the point at which there were shadows of pleuropericardial adhesions. It was possible to follow the path taken by the air in the course of the formation of subpleural, mediastinal and subcutaneous emphysema. Roentgenograms taken on the fifteenth day were normal. The author believes that prolonged labor was caused by the short umbilical cord. The heightened respiratory pressure in the course of the expulsive period, in the presence of increased contractions of the abdominal muscles and diminished elasticity of the lung parenchyma caused by syphilis, were the probable causes of the production of minute lacerations in the pulmonary parenchyma, with consequent formation of subpleural, mediastinal and subcutaneous emphysema.

Deutsche medizinische Wochenschrift, Leipzig

66:589-616 (May 31) 1940. **Partial Index**

*Thymus as Incretory Organ. C. Bomskov and L. Sladović.—p. 589.
*Hyperfunction of Thymus as Disease. E. Rehn.—p. 594.
Surgical Tasks in First Aid Station for Air Raids. A. W. Fischer.—p. 597.
First Attack of Malaria Tropica. L. Stutz.—p. 601.
Results of First Group Examinations in Four Industrial Regions. E. Zapel.—p. 601.

Thymus as Incretory Organ.—Bomskov and Sladović discuss investigations on the relationship between the thymus and the anterior lobe of the hypophysis. They obtained from the anterior lobe of the hypophysis of whales and of cattle forty different fractions and assayed them biologically on guinea pigs, rats and pigeons for the five known hormones of the anterior pituitary, namely the thyrotropic, the gonadotropic and lactotropic hormone, the growth hormone and the diabetogenic hormone. They were able to corroborate the results of other investigators with regard to the first four in proving them independent entities. They failed to differentiate the growth hormone from the diabetogenic hormone and concluded that the two are identical. They investigated the question of whether the growth or the diabetogenic action of the hypophysis is exerted directly or through the intervention of another incretory gland. They were able to prove that it is a "tropic" hormone, that is, one which acts by way of affecting another gland, in this case the thymus. The authors point out that all "tropic" hormones of the hypophysis are protein bodies but that nearly all the hormones formed in the organs that are under the hormonal control of the hypophysis are not proteins but sterols (estrogen, progesterone, testosterone, corticosterone and so on). For this reason they experimented with a lipoid extract from calf thymus and found that the thymus hormone is in the oil fraction of the thymus. The discovery of the thymus hormone made it possible to study the action of thymus in animal experiment. It was found that the thymus hormone increases growth, produces lymphocytosis, inhibits the development of the gonads and reduces the hepatic glycogen. All these functions are characteristic for the infantile organism. The thymus of young animals was found to contain larger quantities of hormone than that of full grown animals. The thymus hormone differs from other hormones in that it does not occur free in the blood serum but is carried in the lymphocytes. The discovery of the thymus hormone has thrown light on such clinical entities as exophthalmic goiter, status thymicolymphaticus and thymus death. Animal experiments demonstrated that the thymus hormone inhibits the action of the thyrotropic hormone of the anterior hypophysis and that neither the thymotropic hormone nor the thymus hormone acts on the normal basal metabolism. Effects which could be produced experimentally with the thymus hormone, namely growth, lymphocytosis and inhibition of the development of the gonads, are also observed in status thymicolymphaticus. Thymus death is an acute heart death, the result of glycogen deficiency of the cardiac muscle. Even small quantities of thymus hormone or of thymotropic hormone produce an extreme reduction in the glycogen content of the heart. In order to determine the involvement of the thymus in other diseases, the authors developed a method which detects in the urine not only thymotropic but also thymus hormone. The predominant effect of both hormones is the mobilization of the carbohydrates. This mobilization differs from that effected by the thyroid in that it produces growth, whereas that of the thyroid produces energy.

Hyperfunction of Thymus as Disease.—According to Rehn, thymus hormone, which during childhood and youth supports growth and is responsible for cell regeneration in adults, may lead to disease and death if its production is unchecked. The mobilization of glycogen from the liver necessary for growth produces, if it goes beyond this need, the diabetes of childhood and complete depletion of glycogen of the liver and heart. The gonads, chief antagonists of the thymus, do not as yet function in childhood and this explains the unchecked course of status thymicolymphaticus in childhood. Periods of hormonal tension before, during and after puberty will lead to thymic disturbances more frequently than will other periods. The author suggests that hyperfunction of the thymus during puberty is responsible for acromegaly and eunuchoidism. That hyperfunction of the thymus plays a part in exophthalmic goiter is proved by the frequent detection of an enlarged thymus in the presence of postoperative heart failure in these patients. The activity of the thymus becomes evident by the elimination of the thymus hormone in the urine, which can be detected by a method devised by Bomskov. The author investigated the function of the thymus in ten cases of exophthalmic goiter. In some the thyroid hormone may produce a secondary hyperfunction of the thymus. If early administration of iodine calms the thyroid in such cases, the irritation and hyperfunction of the thymus disappear. In other cases of exophthalmic goiter the hyperfunction of the thymus dominates the clinical picture. The treatment here must consider the thymus. The author thinks that myasthenia associated with exophthalmic goiter is the result of thymic hyperfunction. Involvement of the thymus should be searched for in every case of exophthalmic goiter. Since the lymphatic system has an important part in the transmission of thymic secretion, it seemed logical to investigate the behavior of the

thymus in one of its most serious disorders, Hodgkin's disease. A severe if not exclusive involvement of the thymus in Hodgkin's disease is manifested by the extreme thymic hyperfunction, by the tremendous amount of hormone which produces a strong lymphatic stimulus and results in blastoma-like foci, by the frequent development of Hodgkin's disease following hormonal tension of puberty, and by the favorable effect of mediastinal irradiations which in reality are irradiations of the thymus. The smallest dose of thymus hormone administered to healthy subjects produces within a few days a pronounced leukocytosis or lymphocytosis. Treatment of hyperfunction of the thymus must aim at a decrease of the functional activity of the organ. The oldest method is surgical reduction, first carried out by Rhen in 1906. Resection of the thymus is advocated for tumor or tumor-like enlargement of the thymus. In cases in which the operation seems too dangerous, roentgen irradiation is preferable. The extreme ray sensitivity of the thymus facilitates this type of treatment but also demands caution, because dysfunction is likewise dangerous.

Wiener klinische Wochenschrift, Vienna

53:415-434 (May 24) 1940

Dietetic Treatment of Dysentery. F. Hamburger.—p. 415.
*Bacteriology, Serology, Pathologic Anatomy and Epidemiology of Dysentery. T. Konschegg.—p. 415.
Myeloblastic Reaction in Atypical Tuberculosis (Avian Tuberculosis). R. Stöger.—p. 419.
Rare Infectious Dermatoses. S. Wolfram.—p. 424.

Bacillary Dysentery.—According to Konschegg, four types of dysentery bacilli can be differentiated serologically: (1) Shiga-Kruse, (2) Kruse-Sonne, (3) Schmitz and (4) the Flexner group, which includes the Flexner, Y and Strong types. The organisms differ likewise with regard to the formation of toxins. The author believes that it is better to speak of severely toxic and mildly toxic than of true and pseudo dysentery bacilli. The morphologic aspects of dysentery do not permit the identification of the type of the bacilli. In some epidemics only one organism was isolated, whereas in others several were encountered. Several organisms have been found in the same patient. Such mixed infections presumably cause especially severe forms. In the course of an epidemic during the Polish war only the Shiga-Kruse bacillus was observed at first, but later the Y and the Flexner types were detected. The author suggests that the most common port of entry is the mouth. The disease is localized chiefly in the large intestine; involvement of the small intestine occurs only in severe cases. In the early stage there exists a catarrh of the mucosa. After a few days or a week the mucosa becomes necrotic. Ulcerations appear during the second or third week, never before the end of the first. They are always present in large numbers and are usually most profuse in the sigmoid and the rectum; they have a tendency to coalesce. Healing cannot be expected before the end of the third week. In some cases new attacks occur before the healing is complete and subchronic or chronic dysentery develops. The most severe but fortunately rare complication of dysentery is intestinal perforation. The articular complications are of the nature of a serous arthritis, occasionally with severe involvement of the bursae. Hepatic abscesses are rare. If death ensues it is usually the result of exhaustion. It is difficult to determine the source of infection in sporadic cases but there is evidence that carriers are responsible. Such carriers may also give rise to epidemics. Dissemination by contaminated food or water is not so important in dysentery as in cholera or typhoid. Epidemics have been caused by contaminated milk or other foods, but such epidemics are the exception. As a rule epidemics are produced by direct contact or by contact through soiled linen, clothing and eating utensils. The dissemination in localities often begins with family or house epidemics which become street and finally town epidemics. Large epidemics occur most frequently during summer and early fall and are more frequent among rural than among urban population. From these and other observations it has been assumed that flies are instrumental in dissemination. Investigations on this problem disclosed that flies which had been in contact with the excreta of dysentery patients harbored dysentery bacilli many hours after such contact. The author emphasizes the great importance of dysentery during war.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

84:1681-1788 (May 4) 1940. **Partial Index**

Burns of Throat. E. Huizinga.—p. 1682.
*Hypertrophic Pyloric Stenosis in Adults. J. F. Nuboer.—p. 1687.
*Pancreatic Lithiasis. J. K. Kraan and L. Meyler.—p. 1695.
Policlinical Psychotherapy. A. H. Fortanier.—p. 1702.

Hypertrophic Pyloric Stenosis in Adults.—Nuboer discusses two adults with pyloric stenosis. The first patient, a woman aged 30, had a history of four years of gastric disturbances. The symptoms and the examination suggested stenosis of the pylorus. At operation a muscular pyloric stenosis and gastritis were found. The second patient, a man aged 36, had a history of frequent attacks of vomiting since childhood and typical ulcer symptoms for the last four years. Clinical examination indicated an ulcer on the small curvature of the stomach, but x-ray examination did not clearly reveal an anomaly of the pylorus. At laporotomy the small curvature seemed shortened and an infiltration was found; the pylorus could be felt as a firm ring. Polya's ventricular resection was done and recovery was uneventful. Microscopic examination of the surgical specimen revealed two small old ulcers on the lesser curvature, chronic erosive gastritis and muscular hypertrophy of the pylorus. The author reviews the literature and emphasizes that the anatomic aspect of pyloric stenosis in adults greatly resembles that seen in nurslings. This fact, and the observation that in adults with pyloric stenosis the history of gastric disturbances often goes back to early childhood, seem to indicate that the pyloric stenosis of adults is a continuation and exacerbation of a congenital defect. Gastric resection is advocated as the best treatment for this condition in adults.

Pancreatic Lithiasis.—Kraan and Meyler report the history of a man who presented symptoms of diabetes mellitus and of nontropical sprue. The disturbances in the sugar metabolism indicated an impairment in the internal secretion of the panoreas. Steatorrhea and other abnormal products of digestion in the feces, the lack of pancreatic ferments in the duodenal juice and the reduction of diastase in the feces, blood and urine indicated a disturbance in the external pancreatic secretion. An x-ray examination of the kidney made because of tenesmus and painful micturition failed to disclose renal or ureteral calculi. A large number of calcium spots were detected in the region of the pancreas. The disorder was diagnosed as pancreatic lithiasis. The literature contains a number of reports on calcification of the pancreas. The symptoms on which the diagnosis is based are (1) pain in the upper part of the abdomen, which is constant and indefinite but may also be colic-like; (2) disturbances in the external pancreatic secretion with resulting diarrhea, emaciation, abnormal feces and deficiency of ferments in the duodenal juice; (3) diabetic symptoms and hypoglycemia; (4) roentgenologic signs. Intermittent hypoglycemia is particularly characteristic of pancreatic lithiasis.

Ugeskrift for Læger, Copenhagen

102:467-496 (May 9) 1940

*Hematogenic Changes in Ileitis, Especially Megalocytic Forms of Anemia. P. Plum and E. Warburg.—p. 467.
Studies on Effect of Diuretics Containing Mercury in Edematous Patients with Special Regard to Water and Chloride Content of Blood: Preliminary Report. A. Petersen.—p. 476.
Ten Cases of Exophthalmic Goiter Treated Operatively. E. Rosen. —p. 481.
Nocturnal Enuresis and Its Treatment. C. N. S. Gundtoft.—p. 483.

Hematogenic Changes in Ileitis.—Plum and Warburg report four cases of regional ileitis characterized by anemia as the prominent symptom. In the three with hyperchromic anemia the hydrochloric acid secretion of the stomach was not affected. Two of the patients had psychic disturbances. The authors suggest that psychic anomalies may depend on the intestinal disorder and the disturbance in resorption. Their cases seem to show that deficiency symptoms are not uncommon in inflammation of the small intestine and that in atypical anemia, perhaps also in pernicious anemia, attention should be directed to the intestine, especially the small intestine. Since definite improvement resulted from treatment with liver in two of the cases of hyperchromatic anemia and has been maintained, they think that some of the regional changes in the ileum may be secondary to a deficiency disease.